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ABSTRACT

The phenomenon studied in this collection of essays is the increasing difference between male and female mortality. The following essays are included: (a) "Fragile Male; Durable or Protected Female?" by Wilson T. Sowder; (b) "Sex Differences in Attitudes toward Health and Related Behavior: A Summary of Four Florida Studies" by James O. Bond; (c) "Sickness and Sex: A Review of Morbidity Survey Data from the United States" by Bond; (d) "Sex Differences in Mortality" by Everett H. Williams, Jr. and others; (e) "Working for Death" by Edward L. Flemming, which considers psychic needs as a factor in increased male mortality; and (f) "From the Literature" by Sowder. Appendixes include reprints of journal articles by the authors of essays in this collection, a list of tables in the text, and a list of figures in the text. (JA)

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MAN TO MAN TALK
ABOUT WOMEN
AND MEN

by

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There are a few key individuals who merit mentioning by name. Mrs. Astrid Ballard, Executive Secretary to the State Health Officer, has by patient and persistent prodding kept our interest in this subject alive despite the almost overwhelming onslaught of routine responsibilities. Miss Doris Hurnie, now deceased, performed all the field work for the twin study carried out in Duval County in 1957 and assembled most of the bibliographic material. Dr. Earl Koos, also deceased, brought to bear the important discipline of sociology in our considerations of this complex subject. Finally, we must acknowledge the untiring efforts of Tom Jarvis, Managing Editor, of the monograph series, who saw that all of the diverse contributions were brought into final, coherent publishable manuscript.

The authors apologize for unintentional omissions in acknowledgments and for defects in content or interpretation. They recognize, and appreciate, that their memories and abilities may be as fragile as their physiques.

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Introduction

WILSON T. SOWDER, M. D.

The purpose of these "Man to Man Talks About Women and Men" is to focus attention upon the fragility of the human male, a phenomenon of increasing importance; to summarize as far as possible the existing scientific information about this aspect of him; to illustrate the need for additional studies in almost every field of the biological and social sciences, and to record the efforts we have made to explain the reasons for his fragility. "The Durable Female" might have been a satisfactory title for this presentation and, perhaps, a more descriptive one.

To avoid any inference of begging the question, it should be pointed out that the phenomenon being studied is, more specifically, the increasing relationship of male over female mortality. Emphasis is upon the word "increasing". During the many years we have been interested in this subject, there have been a number of dialectics necessary to convince friends and colleagues that we are not concerned with a static or teleological problem.

Active and continuous interest in the increasing ratio of male over female mortality has existed at the Florida State Board of Health for some 20 years. It began with the gathering of materials for what was intended to be a humorous talk to a group of friends on the advantages that women have over men. The talk was presented in that vein. The facts learned in the preparation of it stimulated a serious interest which has never waned. Because of the seriousness of the problem, this interest has been concentrated on studies of the mortality ratios. That women on the average live longer than men was a well known fact but apparently little note had been taken in scientific publications of the rather startling fact that these differences had been steadily increasing in recent decades, particularly in the United States. Even where noted, little concern was expressed about it.

The first article written on the subject by a member of our group appeared in The Journal of the Florida Medical Association (see appendix). It pointed out that females had a lower death rate than males and that the corollary difference in life expectancy had existed as far back as records were available. Emphasis was placed upon the increasing differential in death rates of the sexes during recent decades in the United States. This appeared rather startling. Noted was the fact that for the first time in our history, apparently the female population exceeded that of the male. Mention was made that in 1949 there were 106.2 male births in Florida for each 100 female births.

It was stated that deaths of women in childbirth had become almost negligible as compared to total deaths in Florida and in the United States and that diabetes was the only major cause of death from which females suffered substantially greater mortality rates. The death rates for the two sexes from cancer were about the same. Major types of carcinoma among women were those of the breast and the cervix, which were more responsive to treatment than other types. Since there was a satisfactory treatment for diabetes, the outlook for further decreases in mortality appeared more favorable for females than males. Attention was focused upon the special efforts devoted in the past to the care and treatment of women, and the medical profession was urged to investigate and determine whether or not more consideration should be given to the health of men.

At the 1952 Annual Conference of State and Territorial Health Officers with the Surgeon General of the U. S. Public Health Service, the following resolution was introduced:

WHEREAS, the differential in the death rates between males and females in the United States has become progressively greater during the present century. In 1926 the age adjusted death rate for males was a little more than 14% higher than that for females and in 19[illegible]0 the difference had increased to 41%, and
5

WHEREAS, the death rate for females in the United States decreased 22% from 1940 to 1950, the male death rate decreased only 16%, and

WHEREAS, according to mortality figures for the United States for the year 1951 these sex differences in mortality are definite in every age group, and

WHEREAS, the female of the species appears to be born stronger and more durable and the male of the species to be born weaker and more fragile, and

WHEREAS, the specific death rates for most diseases are higher in the case of males than in the case of females, and

WHEREAS, even in the cases of those diseases in which females are peculiarly susceptible such as diabetes, cancer of the breast, cancer of the cervix, the promise for future reduction in mortality seems better than in the case of those diseases to which males are more susceptible.

BE IT THEREFORE RESOLVED, that the Conference of State and Territorial Health Officers recommend to the United States Public Health Service, to the various State Health Departments and to all medical research institutions and foundations that more attention be given to the study of the causes of higher male mortality toward the end that a progressively greater deficit is undesirable from the biological, social and economic standpoints.

Unfortunately, it was not possible to remain for the final session of the Conference when the resolution was considered and, consequently, I was not there to explain that it was intended as a serious matter. As might have been expected, it did not pass. Humorous resolutions are sometime offered at such meetings in order to give diversion from serious business and to provide entertainment. The failure of the resolution to pass did bring nationwide publicity.

Since that time, several articles by staff members of the Florida State Board of Health, published in scientific journals, appear to have had a considerable role in the stimulation of interest in the subject throughout the nation. The press and lay periodicals became interested, and during the past few years tremendous amounts of material have been printed. The interest of the general public, stimulated by these articles no doubt, has contributed greatly to the increasing attention paid by scientists to the subject in this country and, to some extent, throughout the world. Several very excellent studies have been made which have either thrown more light on the subject or demonstrated that the problem is more complex than considered originally.

The Florida State Board of Health group has devoted most of its time and efforts these past 20 years to a comprehensive study and review of the scientific literature. Much time also has been spent in analyzing published statistics from the United States and other countries. Some activity has been devoted to original studies which have been enlightening mainly by illustrating how difficult the problem really is. Even though all these efforts have contributed perhaps little to original knowledge, we believe that the publication of the information we have collected and the assembling of as complete a bibliography as possible may furnish assistance to others interested in the subject. It may provide assistance in finding an answer or answers to the problem which is intensely thought-provoking and, we believe, of tremendous importance.

It may still remain a matter of opinion as to whether females are merely attaining their biologically or teleologically intended position of privilege and superiority, or whether modern society—particularly American — is unwittingly over-compensating for millennia of acknowledged repression and abuse. This will be a problem for the philosophers or social scientists with more courage than the authors. We do not seek a part in such a controversy. We aspire to learn the facts but will take to cover from both the sexes:

When the battle rages loud and long,
And stormy winds do blow.

Thomas Campbell (1777-1844)
"Ye Mariners of England." St. 3

Fragile Male
Durable or Protected Female?

WILSON T. SOWDER, M.D.

A personal interest was aroused nearly two decades ago in male and female mortality trends. Early exploration of this subject resulted in publication in 1952 of "The Fragile Male"* in The Journal of the Florida Medical Association and later of other articles. The possibility of finding some simple and clear explanation of the enigma as to why men die earlier than women was intriguing and fascinating. That there was a basic biological foundation for some of the sex differences in mortality seemed fairly obvious. It also appeared likely that cultural and new environmental influences resulting in a progressive widening of the difference in favor of females had been superimposed upon this foundation within the previous four or five decades. A possible additional or alternative explanation was that these influences, and particularly the cultural, had existed for a longer time, and because of medical, technological, social, and economic developments, had been permitted to operate more effectively.

If these influences could be identified, it was believed that countermeasures might be taken, especially by the health professions, so that males could enjoy, to the extent that their biological handicap permitted, the same improvement in health and mortality that females had experienced during recent decades. As it has turned out, the solution to the problem has not proven to be so simple. A continuing study of the subject with assistance from able colleagues and the advantage afforded by recorded observations of an increasing number of students of the subject has led to the inescapable conclusion that we have here one of the most complex subjects in demography and biology.

This is not a field where facts are scarce and difficult to obtain; nor, generally, a field in which modern medicine or the other sciences have suddenly opened a door to some new problem. The essential facts have been known for several centuries. In 1676 Captain John Graunt in his "Natural and Political Observations" wrote that more males are born and more die and that there are more men than women in the population. Yet, he noted "I have heard physicians say that they have two women patients to one man, which assertion seems very likely. . . . . Now, from this it should follow that more women should die than men, if the number of burials answered in proportion to that of sickness; . . . . or else that men, being more intemperate than women, die as much by reason of their vices, as women do by the infirmity of their sex; . . . ."

*Reprinted in appendix.

The new facts on morbidity and mortality which have been accumulated in succeeding centuries, particularly the present one, resulted from refinements and improvements in the collection of data and better methods of studying and analyzing these. There has been tremendous progress in the diagnosis and treatment of diseases. There have been changes in assignment of causes of deaths which complicate the study of the problem of differences in male and female mortality. Furthermore, we are exposed to and are experiencing new and different diseases as well as revolutionary changes in technology, economics, and social relationships.

Further study has led inevitably to a recognition of many influences that affect both male and female mortality. These vary by era, country, culture, race, occupation, socioeconomic level, environmental factors, age, educational level and by medical and public health services available and used.

Earlier tendencies to oversimplify the problem were due primarily to the assumption that the mortality of the two sexes was affected by one or more of these factors to some constant and measurable degree, after allowance had been determined for a basic and fixed biological difference. As a matter of fact, it now appears more realistic to consider that these factors do not influence male and female mortality in any constant ratio to each other, but that their effect upon the mortality rate of either sex depends upon the vastly complex relationships of all factors involved for that particular sex.

To use some very obvious examples: The saving of lives by successfully treating cancer of the uterus does not improve mortality rates for men, nor does an effective accident control program in a heavy industry affect the mortality of women. It is not at all clear why the decline in death rates for white females age 35-74 from cardiovascular-renal diseases in the period 1930-1960 was not paralleled by a decline for white males—but they are not!

Before proceeding too far in this discussion and speculation, it may be well to state the generally accepted facts. Here are some of them which apply in the United States and generally in the similarly developed nations of Western Europe.

The death rates for males are higher than for females at all ages, particularly after infancy and during the active years until old age. The differences have been increasing steadily during the present century. More favorable mortality rates are experienced by females from nearly all major causes of death, except those occurring only in females. Even rates for the formerly outstanding exception, diabetes, now show a male excess for infants and for persons in the 25-54 year group and a lessening of the difference between male and female rates in the 55-74 year group.

The sex ratio of births by race are distinctly different; in 1963, for example, there were 1057 and 1030 male births per 1000 female births for whites and nonwhites respectively. However, the gap between the races is narrowing, according to figures from the National Center for Health Statistics.

SEX RATIO AT BIRTH*
Males per 1000 Females at Birth

Year	White	Nonwhite	Total
1940	1060	1019	1054
1950	1058	1025	1054
1960	1055	1018	1049
1963	1057	1030	1053

*"Indicators," P. 10, Feb.-Oct., 1965, U. S. Department of Health, Education, and Welfare.

The statement is very frequently made in the literature that the ratio of males to females at conception is even higher, but that during the gestation period there is a consistently greater loss of males. Considerable doubt is cast upon this widely held belief by the recent work of Donaldson and Kohl who found no such higher male fetal mortality rate in the 2641 twin births, occurring among 238,172 deliveries. However, due to the greater number of males born, they outnumber females throughout childhood and up to age 20. The age group 20-24 is the first to show a greater number of females, according to the 1960 census. In fact, until about 1945 males outnumbered females in the total population. The inevitable preponderance of females was delayed by the greater number of male immigrants in the first three decades of the century. Since 1945, females have definitely been in the majority and this situation apparently will continue for the foreseeable future. This is particularly noticeable in the older age groups. The Metropolitan Life Insurance Company has projected the following estimates for the population aged 65 and over by sex for the United States, 1965-1985:

ESTIMATED POPULATIONS AGED 65 AND OVER BY SEX
UNITED STATES, 1965-1985*
ESTIMATED POPULATION IN THOUSANDS AS OF JULY 1

	65 - 74		75 and Over		Total	
Year	Male	Female	Male	Female	Male	Female
1965	5153	6333	2778	3892	7931	10,225
1975	5833	7394	3090	4854	8923	12,248
1985	6712	8888	3567	5839	10,279	14,727

*Statistical Bulletin, Metropolitan Life Insurance Company, Volume 46, November, 1965

The Public Health Service Life Tables for 1964 indicate that the average life expectancy of a white girl at birth is 74.6 years, a white boy 67.7, a nonwhite girl 67.2, and a nonwhite boy 61.1. It is apparent that many thousands of lives would be saved each year if the life expectancies and death rates of the other three groups could reach the favorable levels now being experienced by white females and projected for them in the future.

While males have higher mortality rates, their sickness rates are lower than for females. However, their reported illnesses are apparently somewhat more severe, and when hospitalized, they stay longer. But according to the mass of figures available, there is no direct correlation between sickness and death, strange as this may seem. However, doubt or interpretation is always permitted. In general, women apparently seek and get more medical attention; and the apparent lack of a consistent correlation between days of illness and deaths may be evidence of the benefit of the early recognition of disease and of prompt and thorough treatment. The figures also confirm the astute observations of Captain Graunt of London in 1676.

One should not succumb too easily, however, to the more readily available and probably the more generally accepted explanations.

It may be permissible to draw a parallel between illness, especially subjective illness, and temperature elevation. Fever has long been known as the body's recognition, response and defense against disease. Subjective illnesses, as recorded in sickness surveys, can be considered in the light of these same factors. It seems likely that females are more sensitive to bodily disturbances, reacting by known "illness," and that they seek and put into effect remedial measures. Studies reported elsewhere in this monograph tend to support this hypothesis.

In some of the author's earlier articles on the subject, he remarked that it seemed strange that women should have a progressively more favorable mortality rate during a period when they were subjecting themselves increasingly to hazards that were formerly more or less unique to men. This observation was intended to refer to the progressive use of cigarettes and alcohol by women, as well as to their entry into occupations which were formerly reserved for men. It has been well established, of course, that the use of cigarettes is hazardous and that mortality among those using them is higher. The striking increase in the death rate from lung cancer among males is a definite factor in the widening difference in the mortality rates of the sexes. According to some studies of the subject, women also incur additional risks from the use of cigarettes, although there is some doubt as to whether the risk in the two sexes is in proportion to the number of cigarettes used. In any case, the greater use of cigarettes and alcohol by males contributes to their more unfavorable mortality experience.

The greater exposure of males to accidents also contributes significantly to the difference in mortality and longevity. Its greatest effect is apparent in the age group 15-24. Related to this are occupational hazards. These naturally take a greater toll among men than among women. Men are more likely to be engaged in occupations where they are exposed to unfavorable environmental influences such as polluted air, chemical poisons, etc.

In recent years, the well known relationship between poverty and health has been given fresh emphasis. It has been known for a long time that mortality rates are progressively more favorable as one goes up the socioeconomic scale. The actual reasons for this have not been clearly pinpointed, and it is not known to what extent the various accepted factors, such as poor nutrition, poor housing, inadequate medical care, and ignorance play a part.

The tendency now is to ascribe a much smaller role to race than to socioeconomic conditions. There seem to be areas in which it is well established that there are racial differences in predisposition and resistance to disease. It has been evident in the United States for many years that the mortality experience of Negroes was much poorer than that for whites

In the case of tuberculosis in the past half century, a greater improvement in mortality rates for females has helped to widen the difference in the male and female mortality rates. Syphilis, too, which was formerly much more prevalent, and for which a remedy was only discovered in the present century, is more hazardous to men than to women, and much out of proportion to its occurrence in the two sexes. Until relatively recently diabetes was the single outstanding example of an important disease that took a greater toll in women. Careful study of this subject has been difficult due to changes in the coding of causes of death, but it appears from recent mortality data that diabetes is no longer a significantly greater cause of death among women than among men.

Among the diseases having a different death rate among the sexes, the cardiovascular-renal disease group is the outstanding and the major contributor to the disparity in the death rates of the two sexes.

Not much research or study has been given to the various factors in the biological area that may contribute to the disparity in the death rates of the sexes. A theory has been advanced to the effect that men are biologically handicapped because of the makeup and structure of their chromosomes. While females have 23 pairs of matching chromosomes, males have 22 matching pairs, plus one pair made up of an X and Y chromosome. As a consequence, he has fewer total genes as compared to the female. Others have suggested that a diversity in metabolism and degree of masculinity may be the causative factor.

Psychological theories have been advanced mostly along the line that women are emotionally more expressive and that the repression of emotions, as may be more common in males, is undesirable and unhealthy. Harvey Ernest Jordan, a former medical dean at the University of Virginia, used to say that "maleness is the outcome and expression of catabolism and femaleness is the outcome and expression of anabolism." This could possibly explain why an organism, human or other, which expends a greater proportion of its energy resources is more likely to have a shorter existence than one that conserves and stores more of its energy.

One social factor that has not apparently been carefully studied is the effect of the marriage and the age of marriage on mortality. It is a well known fact that both married men and women have a more favorable mortality experience than the unmarried. It has not been established whether this is due to the fact that individuals who are poorer health risks tend to remain unmarried, or whether the beneficial and protective influence of marriage is responsible. If the latter were the case, it would be worthwhile to study carefully the relative ages of marriage of the two sexes and compare these to the mortality experience.

There is another possibility. Women, rightly or wrongly, regard themselves as more susceptible to illness and the males concerned with them concur. They receive additional care and attention for this reason. The possibility was investigated that this attitude might exist and be applied by parents in infancy and childhood, and further be inculcated in the infants of both sexes with resulting fixed attitudes throughout life. A study on twins of opposite sexes in Duval County, Florida, in part supported this thesis, although in retrospect the authors recognize that their techniques were not sufficiently refined to provide the clear answers desired.

While there may be disagreement regarding the amount of credit due Eleanor of Aquitaine for promulgation of the Arthurian Code of manners, the principles of chivalry did help toward the progressive elevation of the status of women throughout the Western World. This steadily growing influence during the ensuing 800 years has quickened in recent decades and the improvement of the status of women may be one of the most important factors in the increasingly more favorable mortality rates of women. It is, however, necessary to provide supporting evidence for the thesis that the preferred social status of women is a substantial factor that contributes to their better record of survival. This is especially needed if we are to trace with any confidence the beginning of this influence back to the twelfth century, and at the same time explain the accelerating phenomenon occurring during the past half century.

The greater respect and better treatment of women under the code of chivalry applied not only at first but for a long time to the nobility. It certainly never entered the mind of Eleanor of Aquitaine nor the minds of any of her contemporaries that these ideas should apply to the vast majority of women, and certainly not to those in the lower classes. This aristocratic attitude persisted through the centuries and even to some degree up to the present time. It has, however, been slowly dissipated with the development and spread of democracy and the trend toward political and social equality for all classes. But the term "lady" for which the chivalric code was responsible did finally evolve, from the beginning when it was applied only to noblewomen, to a term used to describe nearly all women. And the attitudes toward women that the word implies have paralleled its use. Certainly no considerable effect on the general mortality rates for women could have resulted in the earlier years when only a minute fraction of the female population were receiving the homage and good treatment due them under the new code of manners.

In spite of the age-old belief that noble and aristocratic traits belonged exclusively to those with the right ancestors, the human race has throughout the centuries been unable to distinguish these qualities clearly from wealth and political power. Because of this happy and flexible viewpoint, and because wealth and political power is shared by progressively greater proportions of the population, more and more women in the Western World have benefited by the more favorable treatment accorded them. The revolutionary economic, political, sociological, technological, and medical developments of the past 50 years have made possible the application of the doctrines of Eleanor of Aquitaine to all of the women of the Western World.

In short, it is thought that one of the important reasons for the more rapid decrease in the death rates of women than of men is that they receive more attention and better treatment. In the cultural milieu of the United States and Western Europe, females from babyhood on are highly valued and given preferential treatment over males. In innumerable conscious and unconscious ways they are given the most and the best of the resources available for both sexes. These resources include security from physical danger and from material want. They get better medical care, and they are taught to take better care of themselves. This favoritism is not universal, nor is it always obvious, or applied consciously. And the degree of favoritism may be slight, but it is believed to be an effective element in the better survival record of our women. It is so because we want it that way. Our desire to have it so is deeply based on cultural attitudes and thought habits which have developed over many centuries. As is shown in the review of the literature, different attitudes, especially favoring male children, are prevalent in other societies and cultures. And these attitudes are quite naturally reflected in the survival records of the sexes. But, as is true with so many of the other truths related to this complex subject, the weight and relative effect of this influence is unmeasured and perhaps unmeasurable.

And in conclusion, the writer, after reviewing as much of the scientific literature on the subject as possible, is compelled to agree with Bertrand Russell who said:

"For my part I distrust all generalizations about women, favorable and unfavorable, masculine and feminine, ancient and modern."

Sex Differences in Attitudes Toward Health and Related Behavior

A Summary of Four Florida Studies

JAMES O. BOND, M.D.

Men and women appear to perceive sickness and health differently and behave differently with respect to actions which might prevent, alleviate or terminate sickness. Data have been presented in this monograph which showed clearly the changing mortality trends in men and women in the United States in the last 50 years. With each succeeding generation, the changing mortality ratios between the sexes have become increasingly apparent. Has there been any concomitant changes in the attitudes of men and women toward health and health related behavoir over this period of time? Data from four studies conducted in Florida may provide an answer to this question.

Since the studies, with one exception, were not planned for this purpose, the evidence will be fragmentary and the conclusions uncertain. We hope, however, they will stimulate others to look at their own stored information from the same viewpoint. Perhaps the traditional question, "sex of respondent," will assume a lively new importance in analysis of tables heretofore given only passing attention.

The four studies selected for review represent three broad age groups: infants and children; young adults aged 20-39, and finally the elderly over age 65. The first was carried out as a part of the planned research activities of the Florida State Board of Health on the problem of the "Fragile Male" and was supported by grant from the National Heart Institute of the National Institutes of Health, United States Public Health Service.

Parental Attitudes Toward Health Related Behavior of Their Heterosexual Twins*

A possible explanation for the difference between male and female mortality rates in the United States is the different way boys and girls are taught to view illness and disease or to take the necessary preventive or curative steps. Since these attitudes are formed very early in life, it was decided to investigate the differences in parental teaching and practices toward both their boys and girls. A large number of variables are associated with parental attitudes and practices making it exceedingly difficult to separate the effect of sex alone. As a step toward the ideal conceptual framework for such a study, the parents of heterosexual twins were selected for a sample survey of attitudes. There would be a sameness in the social, cultural, economic and psychological variables in the home, the age and position of the children in the family constellation, and whatever influence genetic and physical factors might play would also be equally distributed between the two sexes. Such a design did not in any way equalize all the variables entering into parental attitudes and practices, but it was more adequate than any other design available to us at the time.

In Duval County, Florida, in 1957, 30 sets of heterosexual twins born between 1949 and 1951 were selected. Their names were obtained from birth certificates and were checked against records for stillbirths and deaths. Parents were identified by birth certificates, and the location of residencies was obtained through city directory services, telephone company files, and other similar sources. The study was limited by design to white parents, since the inclusion of nonwhites would have introduced such large cultural differences that a much larger sample would have been necessary. In the second phase of the study, 12 sets of heterosexual twins born between 1940 and 1942 were selected. These children were 14, 15 and 16 years old at the time of the study. Not all were born in Duval County. In a third phase, 28 sets of twins between the ages of eight and 13 years were identified for study.

The average educational level of the 70 mothers was high school or equivalent. The heads of the households usually had an annual income of five to ten thousand dollars. Typical occupations were store owners, electrical foremen, contractors, precision machinist and teachers. In 64 homes, both parents were present; in five, the widow only was available, and in one, only a

*A summary of the longer report prepared by the late Miss Doris Hurnie who conducted all interviews and prepared the major analyses of data collected divorcee. In 19 families there were two other children in addition to the twins and in 16, one other child. In 11 families other relatives or boarders resided with the family. There were no adopted twins but a few families had adopted other children.

With the assistance of psychology and sociology consultants, an interview schedule was developed and extensively pre-tested. The final form consisted of 136 questions divided into four major groups. In the first group, entitled "Accident and Illness Facts," 34 questions were developed to elicit such information as the frequency of minor and major illnesses, falls, injuries, symptoms and use of simple medical remedies. A second group was entitled "Expectation" and 34 questions were selected to obtain the parents' hopes or planned achievement for the children. Questions were designed to elicit the parents' attitude toward independence for the child, expectations for grades, social behavior, ability to learn, ability to perform simple and complex physical tasks, and the general level of social and educational achievement expected. The third group of questions regarding "Repression and Expression Attitudes" were intended to reveal the overall psycho-social relationships of the parent to the twins in such areas as affection, discipline, love, sexual attitudes, etc. The fourth group of questions was related to the attitudes of parents toward accidents and illness. Each question was paired with a similar question in the first section, and mothers were asked what their attitude was about the fact as reported earlier. This response was paired with the previous response to determine the differences between facts and attitudes. All interviews were carried out with the mother by one individual (D.H.).

The responses were coded as "male," "female," "both" or "neither". Each of the 136 questions was tested for sensitivity and reliability, indicating whether or not the responses showed high correlation with the total score and whether there was significant variation in response. Since there were no objective criteria for testing validity, this was not done. Observed differences in the proportions of sex related responses were tested by standard "T" tests, using the .05 probability level of significance.

In the youngest twins, born in 1949 through 1951, the parents gave sex specific responses in only 34.4 per cent of the total of 4,080 possible replies. The remaining 65.6 per cent were classified either in the "both" or "neither" categories. For the teenage twins, 34.1 per cent of the responses were sex specific and in the eight to 13 year olds, 32.7 per cent were sex specific.

We performed the principal analysis on the data collected from parents of the first group of twins, ages four, five and six. A large sex difference was found regarding accident and illness facts and attitudes. The mothers expected their boy twins to undergo more accidents and illnesses than the girls, and the boys even exceeded these expectations. Mothers thought their boys would injure themselves more often than girls and the fact section of the questionnaire demonstrated that these expectations were correct. Mothers expected that minor ailments, coughing and susceptibility to colds would be suffered more by boys than girls and this also was confirmed. A Chi square test run on the paired attitudes and fact questions showed the sex differences to be significant at the .001 level.

In a comparison of the three different age groups of twins, the attitudes of the mothers toward accidents and illnesses in the boys and girls remained about the same regardless of age of the twins. As the children got older, however, the sex difference in actual illness or injury tended to equalize.

Analysis of the questions in the other two groups, "Expectation," "Repression-Expression," was less rewarding, since much more complex psycho-social attitudes were being measured. The majority of the mothers responded that both twins were treated, or were expected to act, alike or that neither twin indicated a preferential need.

Summary

In a study of the health related attitudes of parents of 70 sets of heterosexual twins in Duval County, Florida, we found the parents expected more accidents and illness in the boy than in the girl twin. When the actual occurrence was measured, the expectations were correct and often exceeded insofar as the sex difference was concerned. In an attempt to measure the more complex relationships, such as the parents' ideas about repression or expression of feelings and attitudes and their expectations and ambitions for their children, no significant sex differences were observed.

Immunization of Florida Children by Sex Groups*

In 1962, the Florida State Board of Health embarked upon a program to insure the immunization of all infants in Florida against five basic preventable diseases. With financial assistance of the National Vaccination Assistance Act, a program was offered to each of Florida's counties whereby all children registered by birth certificates were followed up at three months and at 15 months of age to insure that immunization had been initiated and completed. By January, 1965, 22 counties were participating. During the ensuing five months, data were collected from these counties regarding the immunization status of children 15 months of age who had been followed up by the program. Included were children of all socioeconomic groups and both racial groups. Information was obtained on all vaccinations received in private physicians' offices, in cities or during mass immunization campaigns.

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*Summary prepared from data collected during the Vaccination Assistance Project carried out by the Florida State Board of Health with the assistance of the Communicable Diesease Center, United States Public Health Service.

Final complete data were available on the following numbers of children: 3139 white males, 3050 white females, 1031 nonwhite males, and 1039 nonwhite females. Exactly 3.2 per cent of the white males and females had received no vaccinations whatsoever, but 42.8 per cent of the white males and 44 per cent of the white females had been given all five vaccines. For the nonwhite children, 9.6 per cent of the males and 10 per cent of the females had not received any injections, and 31 per cent of the males and 32 per cent of the females had received all five of the recommended vaccinations.

These data indicate little significant difference by sex of child in the practices of Florida parents insofar as obtaining immunization for their children is concerned . The slight differences are in the direction of more female babies receiving immunization than males.

Sex Differences in the Identification of Public Beliefs About Health Problems*

In conjunction with the Hillsborough County, Florida, oral poliomyelitis vaccination program in 1962, a special behavioral science study was carried out with the assistance of the Department of Epidemiology, University of North Carolina, School of Public Health. The major purposes were as follows:

1. To identify the differences in beliefs and feelings about various diseases as held by certain population groups.

2. To establish relationships between the beliefs and feelings held by persons toward such diseases and their specific health actions.

A new sociological interview technique was developed entitled "The Semantic Differential for Health" (Florida State Board of Health) which consisted of a list of statements about health and actions that could be taken in regard to it. The respondent was asked to score the strength of his feelings on a scale having 21 different levels. A probability sample of 436 persons aged 20-39 was selected. They were living in Hillsborough County at the time of the first interview in January, 1962, before the opening publicity for the mass oral polio vaccination program.

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*A summary of the special Behavioral Science Study performed in connection with the Hillsborough County Oral Polio Vaccination Project, 1962. This data was abstracted from a longer report entitled "Identification of Public Beliefs About Health Problems as a Basis for Predicting Use of Health Services." Final Project Report of contract No. PH-86-63-207 to the Division of Community Health Services, U. S. Public Health Service, Department of Health, Education, and Welfare, by C. David Jenkins, Ph.D., Department of Epidemiology, School of Public Health, University of North Carolina, Chapel Hill, North Carolina.

Three and a half months later, after the intensive vaccination program which included promotion and education regarding polio and the new vaccine, 380 respondents were re-interviewed. In addition, another group of 406 individuals was selected by the same probability sampling frame as used in January. They received the same questionnaire as the "before" and "after" groups, plus a few additional items. All were asked to indicate their ideas and feelings about four diseases, poliomyelitis, tuberculosis, cancer and mental illness. The chief purpose of the survey was to study differences between takers and nontakers of vaccine as distributed by social class, ethnic group and other demographic variables. The following summary is concerned only with the sex differences that were observed.

Women thought about poliomyelitis as having a higher incidence in the general population than did men. They also considered the disease to be more severe and rapidly disabling. The difference of opinion was particularly evident between older women and younger men. Women believed that poliomyelitis was more often talked about, whereas men tended to consider it discussed occasionally. Topics relating to general health and disease appeared more often in the thoughts and conversation of women than men.

Women believed that cancer had a higher incidence in the community than did men. They thought more often about cancer and believed it to be more often discussed; however, they did not report themselves as feeling at greater personal risk than did men. Women and men had similar views about the severity of the disease, chances of recovery, the extent of scientific knowledge and all the other attributes tested by the semantic differential scale.

The persons in the sample were asked whether they ever went to a doctor for medical check-ups when they were not feeling ill. If the answer was "yes," they were asked how often they had such check-ups and the date of the last examination. Women had far more check-ups than men.

In general, there was no association between a man's perception of cancer as either a mild or severe disease and his likelihood of having had a medical examination when not ill; however, for women, several trends appeared. Those who believed cancer to have a high or moderate incidence and considered themselves at high risk tended more often to have had a recent medical check-up. Women who thought about cancer a moderate amount had somewhat more check-ups than those who thought about the disease often or never. Those considering it more painful, mysterious and more often attacking persons younger than themselves had more regular examinations. A belief that cancer "usually" causes death was less likely to be associated with medical check-ups than the belief that cancer "often" causes death. The reason these perceptions tended to be associated with behavior more often in women than in men was considered an interesting observation requiring further explanation.

Differences by Sex in the Utilization of Medical Services by the Population 65 Years of Age and Over in a Retirement Community in Florida*

During the period April, 1959, through mid-January, 1960, a household survey was conducted of non-institutional residents of Pinellas County, Florida, age 65 and over. A schedule of questions designed to define the health needs of this elderly population was administered to 2544 persons. They were selected as a probability sample from city directory listings and aerial maps. The following summarizes the findings of this survey regarding sex differences in the utilization of medical services in this community.

Approximately 80 per cent of the respondents made use of some type of medical service during the period covered by the survey. Seventy-five per cent received care by a physician or osteopath; over one half had laboratory tests or x-rays and nearly one fourth had been hospitalized one or more times during the two years reviewed by the questionnaire. Of the males, 80.2 per cent stated they had a family physician compared to 81.1 per cent of the females. Women obtained the services of their physicians slightly more often than men; an average of 5.0 visits per year was made by women compared to 4.6 for men.

A larger proportion of women (56.5 per cent) than men (46.2 per cent) stated that they had a regular dentist; 36 per cent had seen their dentist within the past year compared to 29.6 per cent of the men.

During the two year period, 25.4 per cent of the males was hospitalized one or more times compared to 22.1 per cent of the females. The males stayed in the hospital in excess of 20 days more often than females (percentage of males 26, females 21). The slight excess of hospitalization rates for males was true for each of three income classes and for the age group 65 to 74, and 75 plus.

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*A summary prepared from Chapter 7 of "The Aged and Chronic Diseases" by Howard W. Carter, M.D., and Irving L. Webber, Ph.D., Florida State Board of Health Monograph No. 9.

Nearly half the respondents stated that they had used medicines and drugs daily. More women than men, relatively, used these products and a considerably higher proportion of them did so on a daily basis. The receipt of laboratory tests and x-rays varied little by sex (42.2 per cent males, 42.7 per cent females). Only 121 persons, comprising 4.7 per cent of the sample population, were using hearing aids; more males (5.2 per cent) than females (4.2 per cent) had such devices.

Discussion and Conclusion

These four studies demonstrate differences in attitudes and behavior regarding sickness and health between men and women in three age groups. The most obvious disparity between the perception of disease and the likelihood of taking action to prevent it was observed in the Hillsborough County study of persons aged 20-39

The immunization levels for infants 15 months of age showed the least sex difference.

The attitudes of the Duval County parents toward their boy and girl heterosexual twins were more often the same than different. When differences occurred; however, it appeared to be in the direction of expecting and observing more health impairing behavior in their boys as compared to their girls.

The utilization of certain health services by the older persons in St. Petersburg was an indirect measure of their health related behavior. An objective assessment of actual need for services would be necessary to evaluate completely the significance of differences in their actual behavior. Older women were more apt to seek the services of a physician or dentist, use more medicines and drugs more often than older men. Only in the frequency and length of hospitalization and the use of hearing aids did the males exceed the females.

From these studies, we have not answered our original question: "Has there been a change in attitudes of men and women toward health and health related behavior over a period of time?" Sex-related differences are evident in three major age groups, and both the magnitude and nature of the sex difference varies with age. We leave for future studies, hopefully stimulated by this review, the demonstration of the relationship, if any, between observed age-related differences and changing behavior patterns of men and women as related to health.

Sickness and Sex

A Review of Morbidity Survey Data from the United States

JAMES O. BOND, M.D.

Most of this monograph has been concerned with the excess force of mortality in the male. It is appropriate also to inquire into the relationships between sex and sickness.

Problems are immediately present which are not encountered in the analysis of mortality data. Whereas, death is a reasonably absolute attribute of man, sickness is often relative, therefore, measurement of sickness is subjective, making comparisons between groups difficult. Furthermore, the law requires a record of all deaths and the completeness of these reports approaches 100 per cent. The accuracy of the diagnosed cause of death may be short of perfection, but it is none-the-less good.

In contrast, sickness is not reportable by law except for the infrequently occurring serious, communicable diseases. Moreover, much sickness never comes to the attention of physicians or hospitals. In some instances, physical well-being may be impaired without the patient being aware of it. Conversely, some persons report sickness when none indeed exists. Knowledge of sickness in the total population therefore is often inadequate and occasionally inaccurate.

Many sources provide some information regarding sickness in the population of the United States. Records are obtained from physicians, hospitals, insurance plans, industrial sickness reports, military statistics and other sources. Each has its own advantages and disadvantages depending upon the manner in which the information is to be used. Comprehensive information on the population at large comes only from sickness surveys conducted by large industrial or governmental agencies. The gain in coverage from these surveys often is made at the expense of accuracy. The informant, usually a layman, responds within the limits of his memory and knowledge of medical conditions.

The results of four major surveys carried out in the United States within the last decade are summarized in this presentation. Reliable comparisons cannot be made since different methods, techniques and populations were involved in each of the individual studies. However, our major purpose is to look for sex differences in morbidity within any given population group and each of these surveys contributes relevant information. A brief description of the methodology will be presented initially and, therefore, we assume the reader will recall this description or refer to the original by published reference for details which cannot be covered in this brief summary.

National Health Survey, U. S. Public Health Service

Estimates of Morbidity, Limitations of Activity and Severity of Illness

The United States Public Health Service has conducted periodic national health surveys with the assistance of the Bureau of Census since 1957. The surveys are probability samples of households based upon the entire population of the United States. During each annual period, approximately 42,000 households involving 134,000 persons are included in a survey. Interviewers from the Bureau of Census, using carefully prepared schedules, obtain information from each household on a weekly basis making it possible to combine the samples into weekly, quarterly or annual estimates of acute and chronic conditions. The numbers presented in the following paragraphs are estimates from samples and have the usual variations inherent in such data. Detailed reports of the National Health Survey give statistical tables to measure the reliability of individual estimates and these should be referred to for further refined analysis of the quoted information.[1]

Incidence of Acute Conditions, July, 1963 to June, 1964.

During the 12 months ending June, 1964, the civilian population, excluding residents of institutions, experienced an estimated 387.4 million acute illnesses or injuries requiring medical attention or reduction in daily activities, an incidence rate of 208.5 per 100 persons.[2] Females experienced a somewhat higher rate than males — 216.4 cases per 100 females compared with 200.0 per 100 males. The higher rate among females was largely attributed to respiratory illnesses and to the group entitled "All Other Acute Conditions" which included genitourinary disorders and the sex-specific group of "Deliveries and Disorders of Pregnancy and the Puerperium." Of the four major categories, "Infection and Parasitic Diseases," "Respiratory Conditions," "Digestive System Conditions," "Injuries," and "All Other Acute Conditions," the male exceeded the female only for "Injuries." The injury rate for males was 13.2 percentage points higher than that for females.

Little sex difference was noted in the high incidence rate of acute conditions during early childhood up to age 10. After this age the female rates always exceeded the male. More acute illness was reported for female workers than for male workers.

For all acute conditions reported, there were 731.7 days of restricted activity per 100 males per year compared to 886.5 days per 100 females per year. Similar figures for days of bed disability were 303 for males and 386 for females. As a measure of the impact of illness, persons were classified as (a) those medically attended only, (b) those who were medically attended and had restriction of activity, and (c) those who had activity restriction but were not medically attended. In these three categories the number of acute conditions per 100 persons per year by sex were (a) male 58.9, female 59.4, (b) male 72.0, female 78.8, (c) male 69.1, female 78.3.

A question was included regarding the days absent from school for each child. For males the number was 423.6 and for females 461.1 per 100 children per year. The incidence of these acute conditions and disability was examined by residence in urban, suburban and rural areas by region of United States, calendar quarter of the year, type of disability, and time loss from school and work. In each instance the rates for females exceeded those for males.

Chronic Conditions and Activity Limitations in the United States July, 1961—June, 1963.

During the 24 months from July, 1961 to June 1963, 80,000 households containing 259,000 members selected by the National Health Survey as a probability sample were interviewed[3]. Each person was questioned about his chronic conditions and impairments and those reporting one or more were asked to indicate their limitation of activity. An estimated 80 million persons, or 44.1 per cent of the civilian non-institutional population, experienced one or more chronic diseases or impairments during this 24 month period, an average of 2.0 per person. For those over 17 years of age, a greater proportion of females than males reported having one or more chronic conditions. This sex difference was reversed for persons under age 17. A higher percentage of males than females were unable to carry on their major activity; however, for the lesser degrees of limitation, the percentage of females surpassed that of males. Although more females reported general limitation of activity, many of the chronic conditions occurred more frequently in males. These included tuberculosis, malignant neoplasm, asthma, heart trouble, hernia, hearing defect, paralysis of one or more limbs and back trouble. Females reported more benign neoplasms, diabetes, mental and nervous disorders, hypertension without known heart trouble, varicose veins, circulatory trouble, digestive trouble, genitourinary problems, arthritis and visual impairment.

Baltimore Chronic Illness Study, 1954-1955

A comprehensive large survey for prevalence of illness in a general population was conducted in Baltimore by the Commission on Chronic Illness in 1954-55.[4] Interviews were conducted in a representative sample of households numbering 3828. An informant reporting for himself or herself and other members of the family provided data on illness the previous day, previous four weeks and previous 12 months.

A ten per cent sample was chosen from this larger group for exhaustive clinical examinations. Another sample of approximately 50 per cent of the original group was invited to participate in multi-phasic screening for dental, medical and surgical conditions. When the prevalence of chronic disease in the medically examined group was compared with the amount detected by screening and from household interviews, it was found that less than one fourth of the diagnosable conditions had been reported. For males the completeness of reporting was 26 per cent and for females 32 per cent. However, for individual conditions reported, no difference by sex was evident in the match of reported medical defects with those found by clinical examinations (76 per cent for men, 78 per cent for women).

Of the 809 patients clinically tested, females exceeded males for prevalence of chronic illness (female/male ratio 1.2). However, at ages under 15, male rates exceeded females markedly, and slightly so at age 65 and over. In the middle aged group, females dominated with 30 per cent excess chronic conditions. Similar ratios for chronic sickness were recorded in the household interviews (female/male ratio 1.3). Females had more of these specific medical conditions: diabetes, neoplasms, arthritis, mental illness, syphilis and dental defects. Males had a higher prevalence of heart disease and malignant neoplasms.

Since prevalence of an illness is directly related to the product of incidence by duration (P-IxD), a high prevalence rate may be due to minor diseases with a high incidence and short duration. Such was not the case in the Baltimore study, since only chronic diseases of serious import were reported by the examining physicians. Moreover, the excess female ratio pervaded all grades of disability. Almost three times as many females as males had limitation of daily activities due to chronic diseases (ratio 2.95). For one day or more disability, the female to male ratio was 1.4; for conditions preventing usual activities it was 1.2 and when the person was confined to bed the ratio was 1.4. When the total days of disability in the prior four weeks were expressed as a rate/100, the female rate was 47 per cent in excess of the male (male 75.9 and female 111.9). For those with disability of three months or more, the female rate was 19 per cent in excess of the male rate. During the year preceding interview, each female had spent on the average three days in bed with disabling sickness and each male, two days. Thus it appeared evident that Baltimore females have more chronic illness which causes more disablement.

California Health Survey, 1954-1955

Another major survey of sickness in the general population was the California Health Survey of 1954-55.[5] A representative sample of 200 households from the entire state was visited each week for 52 weeks. Information regarding sickness, accidents, disability, medical care and hospitalization was obtained for each member of the household 18 years or older. An informant represented children and absent members.

Because of the known errors in the informant type of response, reinterviews were conducted on a sub-sample in an effort to obtain information directly from the person involved. The increases obtained, higher for males than for females, were used to adjust upward the initial rates. Many of the original reports on males were obtained from other members of the family. In the second interview the individual reported for himself, and the increase in rates was 22 per cent for disabling illness, 17 per cent for number of days disability and 49 per cent for chronic conditions. Corresponding female increases were seven, nine and 32 per cent respectively. Obviously, some of the reported female excess of sickness was due to under-reporting of male conditions by initial informants.

The incidence of reported chronic conditions per 1000 persons per year was higher for females, female to male ratio of 1.6. The ratio for cardiovascular disease was 1.9; respiratory, 1.1; arthritis and rheumatism, 1.7 and neuromuscular and orthopedic, 1.5.

The incidence of acute illness reported per 1000 persons per year was only slightly in excess for females (ratio of 1.04). For specific types the ratios were: respiratory, 1.0; gastrointestinal, 1.0; other communicable diseases, 0.8. Considering only disabling acute illness, the female rates were still slightly higher.

During the year preceding interview, females reported more days of disability. For acute illness the excess was three per cent; and chronic illness, seven per cent.

The female to male ratio was 1.13 for the total number per 1000 persons experiencing a chronic condition during the year. With conditions requiring one or more days in bed, the female to male ratio was 1.31. Limitation of activity was graded on a scale 1 (cannot get around without help) through 4 (can carry on usual activity but must cut down other activity). The female to male ratios for these four categories were 1.3, 0.4, 1.4 and 1.4 respectively.

Females were often placed in the disability classification of "can carry on usual activity, but must cut down on type and amount of other activities." The males, on the other hand, were found in the category "cannot carry on usual activity." This difference was explained on the basis that females could perform their regular housework with some disability while a male could not carry on his usual activity, which usually required greater effort.

New York City Health Insurance Program Survey, 1951

A third household survey was conducted in New York City in 1951 to determine differences between sickness and utilization of medical care for a group of insured and non-insured families[6]. A sample of 3235 households represented 2.7 per cent of the insured group in New York City, and 4190 were a 0.2 per cent sample of the non-insured families. Information was obtained from a responsible member of each family by single visits.

The rates per 100 persons for those with illness requiring medical care on the day preceding interviews were slightly higher for females in both insured and uninsured families (1.2 and 1.4). Males under 15 had higher rates than females, but rates were reversed over this age. Similar observations were made for prevalence of illness in the eight days prior to interview with females having higher ratios in both insured and uninsured groups for allergies, metabolic disturbances including obesity, endocrinal, circulatory, respiratory, digestive, genitourinary, skin and arthritic conditions. Male excesses in the insured group were recorded for asthma, ear diseases, gastric ulcer, heart diseases and accidents.

Females had higher case rates of acute and chronic illness in all degrees of severity, with the exception of acute illnesses which were non-disabling.

For both sexes the insured groups reported more acute, relatively minor illnesses. Chronic or more serious disabling illnesses were more prevalent in the non-insured group. Differing concepts of health or thresholds of detected sickness probably accounted for this variance. The excess of chronic diseases in females was slightly greater for the non-insured group.

Utilization of Hospital and Physician Services

Women appear to detect illness in themselves more frequently than men, seek medical attention earlier and more often, and perhaps take greater care to prevent serious illness. Information regarding the utilization of hospital and physician services by sex is presented in the following summary:

Persons Hospitalized in the United States, July, 1960 through June, 1962.

In the National Health Survey of 76,000 sample households comprising 250,000 persons during the period July, 1960 through June, 1962, findings indicated that approximately 16.6 million of the U.S. population were hospitalized during an average year, a rate of 93 persons with one or more hospitalizations per 1000 population[7]. The rates for males increased with advancing age from 56.1 under 15 years of age to 117.7 at 65 years and over. Among females, however, a similar consistent pattern was interrupted by the higher rate among those aged 15 to 44 years, an interval when there were many hospitalizations for the birth of children. During this period, the rate for females was 182 per 1000 persons compared to 59 for males. This marked difference (related almost entirely to hospitalizations for pregnancy and delivery) was of sufficient magnitude to account for the substantial difference between hospitalization rates for males and females of all ages. At every other age interval, including those under 15 years of age, those 45 to 64 and 65 and over, the male rates exceeded or were equal to the female. Males in addition, tended to have more multiple episodes of hospitalization and longer hospital stays. They averaged 12.1 days per year compared with only 8.2 days for females. Conditions such as mental and nervous disorders, hemorrhoids, diseases of the gallbladder, arthritis, and impairments of the musculoskeletal system accounted for these hospitalizations. Only 56.1 per cent of the total males hospitalized had a single episode of one to seven days, compared to 68.4 per cent of the hospitalized females. A significantly higher percentage of males had single hospital stays of eight to 30 days, and confinements of 31 days and longer were much more common among males.

Physician Visits in the United States July, 1963 to June, 1964.

Persons in the civilian, non-institutional, population of the United States had an average of 4.5 physician visits per person per year during the period July, 1963 to June, 1964[8]. Approximately 70 per cent took place in the physician's office, five per cent in the home, 12 per cent in the outpatient clinic of the hospital and 11 per cent by telephone. Among children under 15 years of age, males averaged more visits per year than females, although the differences were very small (under five years of age, males 5.7, females 5.3, five to 14 years, males 2.9, females 2.7). In every other age group, however, females had a higher rate than males, even when visits for prenatal and postnatal care were excluded. The excess female visits to physicians were consistent when the data were examined by geographic region of the United States, by race, family income, marital status, type of limitation of activity and by usual activity status. The small sex differences by type of service rendered were found mostly attributable to the 7.3 per cent of all visits to physicians for prenatal and postnatal care. Excluding these, little sex difference was evident whether service was obtained for diagnosis and treatment, general checkups, immunization or vaccination.

The question "during the past 12 months, was this individual taken to a doctor for routine physical examination, that is, for a general check-up?" was asked for each person under 17 in the National Health Survey sample. Forty-five per cent of the males under age six had had check-ups compared with 44.7 per cent of the females; from age six to 16, 32 per cent of the males and 29.5 per cent of the females received routine medical examinations. This very slight sex difference favoring males held for rural and urban residents of each geographic region of the United States, for race, and for family income group. The one exception was families having an income under $2,000; in these, the female under age six received slightly more general routine check-ups than the male.

In the California survey[5], females exceeded males slightly—ratio 1.3 for total physician visits per person per year—female 5.8, male 4.5. The difference was more evident when visits for health supervision alone were considered—female/male ratio 1.5.

Some measure of attitudes toward health protection was afforded by the Baltimore survey when an opportunity for medical screening examinations was offered to a large group[4]. The response of males was 61 per cent and of females 58 per cent. In an analysis of the need for changes in attitudes toward physical or mental conditions, no sex differences were detected.

Various medical needs were assessed in the group receiving complete clinical examinations. Slightly more females than males were thought to need periodic check-ups. The female to male ratio for those needing further specialized consultation was 1.3, those needing surgery 1.8 and those needing dietary advice 1.7. The females in Baltimore not only had more chronic conditions but appeared also to have had no better care in the past than the males.

According to the New York City study, males were less likely to be seen by a doctor[6]. However, if they had an actual acute condition during the preceding eight weeks, more males saw a physician and made more frequent visits than women.

The procurement of health and hospital insurance may be a reflection of interest in protection against sickness. In the California survey, 53 per cent of the male population and 51.1 per cent of the female had some type of health insurance. In the New York City survey, females in the labor force were more likely to have insurance than males. Men not in the labor force had the poorest coverage. These figures more likely reflect the close relationship of health insurance to employment than sex differences in attitudes toward health.

Discussion

We are presented with an interesting paradox if the information in this chapter can be generalized. Whereas males have uniformly higher mortality rates in the United States, the rates for sickness both acute and chronic are lower than those for females. The sickness they report in surveys may be of somewhat greater severity and more disabling than that reported by females; however, the evidence is not consistent. The female apparently seeks and obtains the services of a physician more often, except at the very young ages where injuries bring boys under medical attention quite frequently. When the sickness is such that hospitalization is required, the male apparently is more frequently hospitalized and needs to stay in the hospital longer.

Either little or no relationship exists between the reported rate of male sickness and actual mortality or some error has been made in measuring sickness experience by sex. The latter is more likely correct. Males could have short, severe illnesses resulting in death which are not frequently detected in morbidity surveys. Accidental deaths exemplify this situation. Deaths due to arteriosclerotic heart disease, the most common cause of male fatality, would seem to least fit this description. Conditions preceding most male deaths are thought to be of long standing but either these produce no disability, the disability is ignored or is of such a nature it cannot be detected easily with our available techniques. Differences in attitudes between men and women for reporting illness and seeking medical care are obvious. A longitudinal study of illness in comparable groups of men and women in New York City makes this clear[9]. Women experienced a higher incidence of illness, greater disability and made more trips to physicians. Culturally determined differences in attitudes toward what constitutes illness and creates an acceptable reason for disability were given by the investigators as the most likely cause for these differences between men and woman. They speculated "the tendency of the American male 'to carry on, no matter what' as indeed having something to do with the greater longevity among women." The latter is subject to change by education and medical preventive services and should be attacked directly by public health programs in the future.

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Sex Differences in Mortality

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Death rates for females are not only lower than those for males, but they are decreasing at a greater rate. The difference in the rate of decline coupled with the fact that fewer females die has produced a progressively widening gap between male and female death rates during the past century. Statistical evidence indicates a continuation of this trend.

The differences are demonstrated by a study of age-adjusted death rates for the United States and for Florida. The rates by race and sex and the ratio of male to female rates for the nation and for the state are presented in Table 1. The 1940 census of the United States was used as the standard and all rates were adjusted to that age distribution.

The white male death rate in the United States for the year 1900 was 18.4 per thousand population and there has been a continuous decrease at each decade. In 1930, the rate was 12.8 and in 1960 it was 9.2 per thousand population. White female death rates decreased from 16.8 in 1900 to 10.6 in 1930, and then to 5.6 in 1960. They were lower than the corresponding rate for males at each decade (Fig 1). Between 1930 and 1960, the white female death rate decreased 48 per cent while the male rate decreased only 28 per cent. The ratio of male to female death rates for whites for the United States was 1.10 in 1900 (i.e., males ten per cent higher). With the exception of the year 1920, this ratio increased at each decade. In 1930, the male excess mortality was 21 per cent and by 1960 had reached 64 per cent (Fig. 2). The death rates and resulting ratios for 1920 were probably affected by the very high mortality recorded during the 1918 influenza epidemic.

Nonwhite death rates show a similar trend, but at a higher level. In the United States, nonwhite male death rates decreased from 28.7 per thousand population in 1900 to 21.0 in 1930, and then to 12.1 in 1960 (Table 1). The corresponding rates for nonwhite females were 27.1 in 1900, declining to 19.2 in 1930, and to 8.9 in 1960. With the exception of 1920, they were lower than those for nonwhite males (Fig. 1). Between 1930 and 1960, the nonwhite female rate dropped 54 per cent as compared to 42 per cent for the male rate. In 1900, the nonwhite male mortality was 6 per cent higher than for females and except for 1920

Table 1.—Age-Adjusted Death Rates per 1,000 Population, by Race and Sex, and Male to Female Mortality Ratios, United States, 1900-1960, Florida, 1920-1960.

Year	White			Nonwhite		
	Death Rate		Male/Female Ratio	Death Rate		Male/Female Ratio
	Male	Female		Male	Female	
			United States			
1960	9.2	5.6	1.64	12.1	8.9	1.36
1950	9.6	6.5	1.48	13.6	10.9	1.25
1940	11.6	8.8	1.32	17.6	15.0	1.17
1930	12.8	10.6	1.21	21.0	19.2	1.09
1920	14.2	13.1	1.08	20.4	21.0	0.97
1910	16.7	14.4	1.16	24.8	23.2	1.07
1900	18.4	16.8	1.10	28.7	27.1	1.06
			Florida			
1960	8.5	4.7	1.81	13.0	9.3	1.40
1950	9.1	5.6	1.62	14.7	11.0	1.34
1940	11.5	7.5	1.53	20.1	15.8	1.27
1930*	13.1	9.8	1.34	23.3	19.5	1.19
1920*	13.0	12.1	1.14	19.5	18.8	1.04

*Based on recorded deaths. Resident deaths not available.

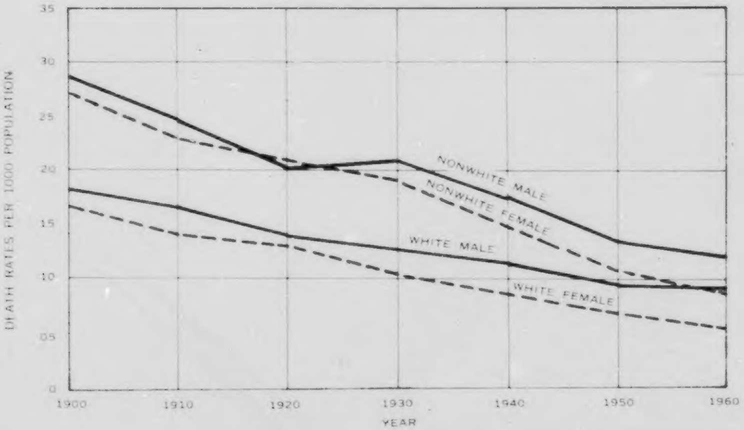
Source: Vital Statistics of the United States, U.S. Department of Health, Education and Welfare, Vol. II, A, 1960.

when female mortality was 3 per cent higher, there was little change in the ratio through 1930. In 1930, the male excess mortality was 9 per cent and this increased to 36 per cent by 1960 (Fig. 2).

In comparison with figures for the white, nonwhite mortality is higher but has shown a greater percentage decrease, particularly since 1930. Nonwhite male mortality is higher than comparable female data, but the differences are not as great as those shown for the white race.

The figures for Florida, available since 1920, show a pattern similar to that of the nation. For the white race, Florida death rates were lower than corresponding national rates with the single exception of white males in 1930. Nonwhite death rates in the state were higher than corresponding national rates except for the year 1920. Florida figures show wider differences between male and female mortality (Fig. 2). In 1960, the state had an excess male morfality of 81 per cent in the white race as com-

Fig. 1.—Age-Adjusted Death Rates by Race and Sex, United States, 1900-1960.



pared to the national excess of 64 per cent. The nonwhite male excess mortality was 40 per cent in Florida and 36 per cent for the nation.

In the remainder of this discussion, analyses will be limited to figures for the white race because this is where the male to female mortality ratios are higher. It will also greatly reduce the volume of data.

Age-Specific Mortality

Age-specific white death rates and male to female mortality ratios for the United States since 1900 are shown in Table 2. The downward trend of male and female mortality for each age group is shown in Figure 3 and the greater decline in female mortality For example, between 1930 and 1960 death rates for girls ages male to female mortality ratios by age are pictured in Figure 4. The 1960 ratios were higher at ages 15-24, 45-54, and 55-64. These were the ages where female death rates declined much more than comparable male rates. Mortality differences were smallest for ages under 15 years and 75 and over. The differ-

Table 2. — Age and Sex Specific Death Rates and Male to Female Ratios for White Race, United States, by Decade, 1900-1960.

Year	Age										
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 +
	Male Death Rate per 100,000 Population										
1960	2694.1	104.9	52.7	143.7	163.2	332.6	932.2	2225.2	4848.4	10299.6	21750.0
1950	3400.5	135.5	67.2	152.4	185.3	380.9	984.5	2304.4	4864.9	10526.3	22116.3
1940	5670.0	281.2	111.5	197.3	281.0	507.2	1138.6	2521.9	5399.9	12202.3	25135.1
1930	7154.0	553.7	180.5	297.7	406.5	650.9	1231.2	2552.2	5512.2	11921.4	23762.2
1920	9810.3	984.1	271.4	424.9	594.3	765.3	1197.9	2420.9	5418.5	12250.4	25358.2
1910	14269.6	1424.1	296.3	469.4	672.1	968.7	1495.1	2841.1	5857.9	12764.1	25794.3
1900	17586.5	2016.4	377.6	579.8	813.2	1059.3	1550.4	2851.8	5913.2	12822.9	26917.5
	Female Death Rate per 100,000 Population										
1960	2007.7	85.2	34.7	54.9	85.0	191.1	458.8	1078.9	2779.3	7696.6	19477.7
1950	2566.8	112.2	45.1	71.5	112.8	235.8	546.4	1293.8	3242.8	8481.5	19679.5
1940	4359.4	241.2	81.3	139.7	217.6	367.2	746.8	1684.4	4153.6	10482.6	23495.3
1930	5602.3	478.4	140.3	253.7	362.6	516.8	924.6	1993.2	4601.9	10755.8	22514.1
1920	7612.4	900.4	232.2	431.6	652.7	726.4	1086.8	2171.3	4993.3	11639.0	24695.1
1910	11524.0	1304.5	277.9	405.9	593.7	766.0	1178.2	2337.1	5224.1	11780.6	24814.0
1900	14262.8	1869.4	376.2	562.8	806.1	962.1	1397.6	2551.7	5341.7	11885.1	25674.8
	Male to Female Ratio										
1960	1.34	1.23	1.52	2.62	1.92	1.74	2.03	2.06	1.74	1.34	1.12
1950	1.32	1.21	1.49	2.13	1.64	1.62	1.80	1.78	1.50	1.24	1.12
1940	1.30	1.17	1.37	1.41	1.29	1.38	1.52	1.50	1.30	1.16	1.07
1930	1.28	1.16	1.29	1.17	1.12	1.26	1.33	1.28	1.20	1.11	1.06
1920	1.29	1.09	1.17	0.98	0.91	1.05	1.10	1.11	1.09	1.05	1.03
1910	1.24	1.09	1.07	1.16	1.13	1.26	1.27	1.22	1.12	1.08	1.04
1900	1.23	1.08	1.00	1.03	1.01	1.10	1.11	1.12	1.11	1.08	1.05

ential between male and female mortality has increased greatly since 1930.

The greatest improvement in death rates was for children under 15 years of age. However, at these ages the decline in death rates for boys did not quite keep pace with those for girls. For example, between 1930 and 1960 death rates for girls age 5-14 decreased 75 per cent as compared to a 71 per cent decrease for boys. The excess male mortality for this age group was 29 per cent in 1930; it rose to 52 per cent by 1960. Similar changes are noted for infants—boys were 34 per cent higher in 1960—and in the 1-4 year group where boys were 23 per cent higher in 1960.

Fig. 2.—Ratio of Male to Female Age-Adjusted Mortality Rates by Race, Florida, 1920-1960, and United States, 1900-1960.

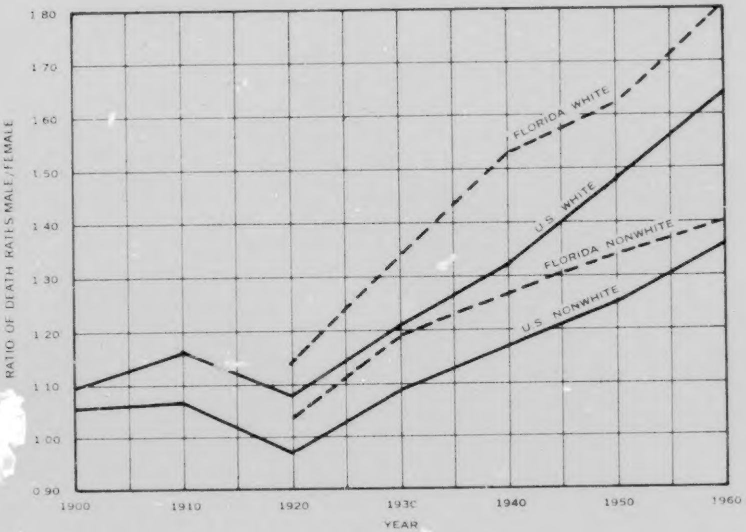


Fig. 3.—Age-Sex-Specific Death Rates, United States, White Race, 1900-1960.

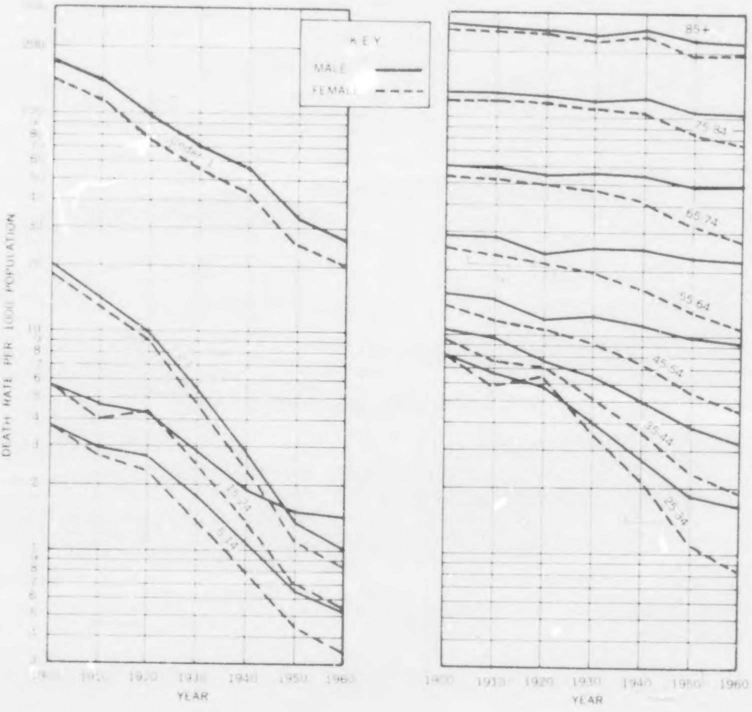
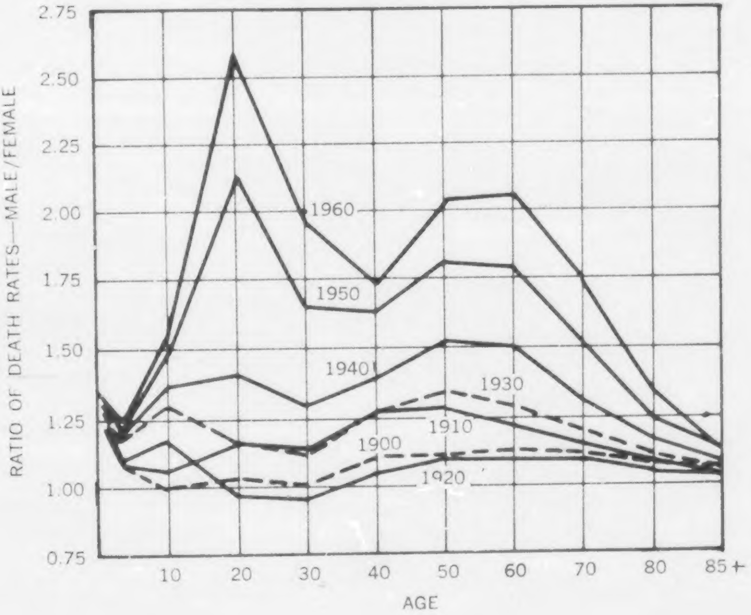


Fig. 4.—**Male to Female Mortality Ratios by Age, United States, White Race, 1900-1960.**



In young adults, the male death rates have not kept pace with the decrease in female rates. For age groups 15-24, 25-34, and 35-44, female death rates dropped 78, 77, and 63 per cent respectively between 1930 and 1960. During the same period, comparable male rates dropped 52, 60, and 49 per cent. The greatest difference between male and female mortality was recorded in the 15-24 year group where excess male mortality changed from 17 per cent in 1930 to 162 per cent in 1960. During the same 30 year period, excess male mortality in the 25-34 year group rose from 12 per cent to 92 per cent and in the 35-44 year group from 26 per cent to 74 percent.

The second and third greatest sex differences were noted in the rates for ages 45-54 and 55-64. Between 1930 and 1960, the death rates for women in these two groups dropped 50 per cent and 46 per cent. Death rates for men lagged far behind with decreases of 24 per cent and 13 per cent respectively. In the 45-54 year age group, excess male mortality changed from 33 per cent to 103 per cent during the 30 year period, while the 55-64 year group rose from 28 per cent to 106 per cent.

For ages 65 and over male death rates were higher than those for females but the differences became smaller with increasing age. For age groups 65-74, 75-84, and 85 and over, the decreases in death rates for women between 1930 and 1960 were 40, 28, and 13 per cent as compared to decreases of 12, 14, and 8 per cent for men. In the 65-74 year group, the male death rate was 20 per cent higher than that for females in 1930 and 74 per cent higher in 1960. The 1960 male excess was 34 per cent higher for ages 75-84 and 12 per cent higher for those 85 and over.

In observing the effects of sex differences in mortality on the composition of the population, it is necessary to consider the size of the differentials as well as the ratios. Mortality rates increase sharply after age 45 and sex differentials above this age have a proportionately greater effect on the ratio of men to women in the population. Thus, the extremely high mortality ratio in ages 15-24 does not have as great an effect on population composition because of the relatively low death rates. This may be an indication, however, of even higher future sex differences in mortality for older groups.

England and Wales

Figures for England and Wales, available since 1841, go back almost 60 years prior to the earliest ones for this country. The data show a continuous upward trend in excess male mortality since 1841 and the differences have accelerated since 1931 (Fig. 5). The pattern for England and Wales was similar to that of the United States through 1931. Since that year, the male to female mortality ratios for the two countries have been similar for ages under 15 and over 55 years; however, for all ages between 15 and 54, mortality ratios have increased more rapidly in the United States. For example, in the age group 35-44 in 1960, the male excess was 74 per cent for the United States whites as compared to 38 per cent for England and Wales in 1961. This can be seen in Figure 6 and in the data presented in Table 3. Data for England and Wales are shown for 1931 and 1961 because these were census years.

A comparison of age and sex specific death rates for England and Wales in 1961 and for the United States in 1960 shows that male rates for the United States were about one third higher than those for England and Wales in the 15-54 year group while rates for females show no great differences. This accounted for the higher male to female mortality ratios in ages 15-54. In age group 55-64, death rates and resulting ratios were almost identical. For persons 65 years and over, the United States had lower death rates for both males and females, but the male to female mortality ratios were very close to those for England and Wales.

Fig. 5.—Male to Female Mortality Ratios, by Age, England and Wales, Selected Years, 1841-1961.

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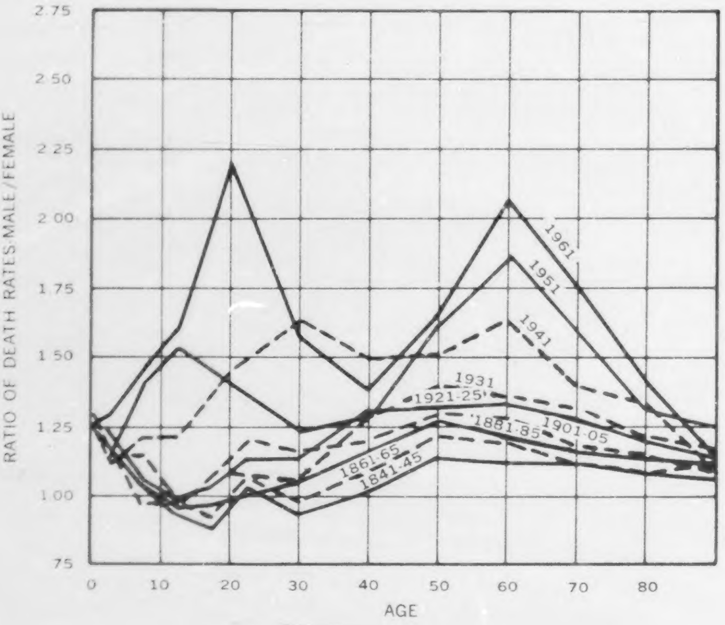


Table 3.—Age-Specific Male to Female Mortality Ratios, United States (White), 1930 and 1960, and England and Wales, 1931 and 1961.

Age	England and Wales			United States, White		
	1961	1931	Difference	1960	1930	Difference
Under 1	1.26	1.30	-.04	1.34	1.28	.06
1-4	1.30	1.14	.16	1.23	1.16	.07
5-9	1.45	1.15	.30	1.40	1.25	.15
10-14	1.60	0.99	.61	1.68	1.32	.36
15-24	2.19	1.08	1.11	2.62	1.17	1.45
25-34	1.58	1.06	.52	1.92	1.12	.80
35-44	1.38	1.28	.10	1.74	1.26	.48
45-54	1.63	1.40	.23	2.03	1.33	.70
55-64	2.06	1.36	.70	2.06	1.28	.78
65-74	1.76	1.32	.44	1.74	1.20	.54
75-84	1.42	1.21	.21	1.34	1.11	.23
85 +	1.13	1.16	-.03	1.12	1.06	.06

Fig. 6.—Male to Female Mortality Ratios by Age, United States, White Race, 1930 and 1960, England and Wales, 1931 and 1961.

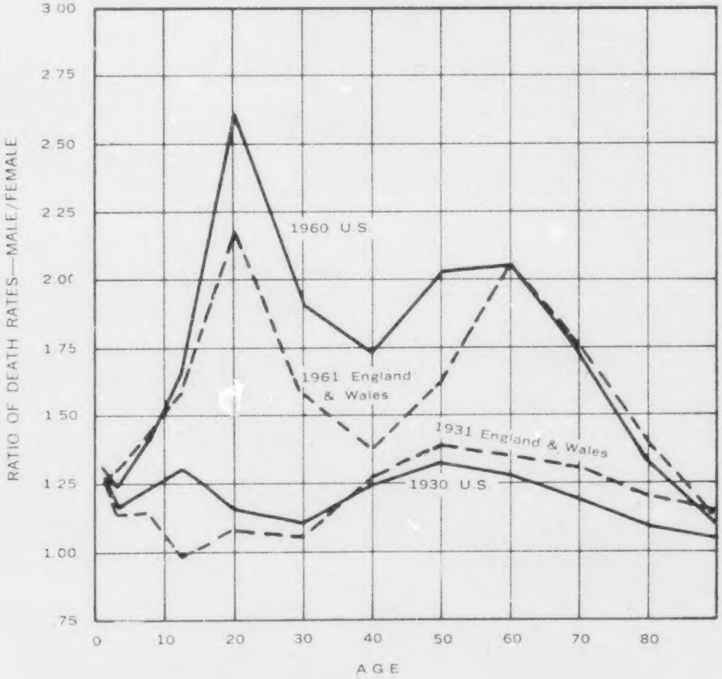


Table 4.—Male to Female Mortality Ratios by Cohort Birth Year, by Age, White Race, United States.

Cohort Birth Year	AGE								
	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
1810									1.05
1820								1.08	1.04
1830							1.11	1.08	1.03
1840						1.12	1.12	1.05	1.06
1850					1.11	1.22	1.09	1.11	1.07
1860				1.10	1.27	1.11	1.20	1.16	1.12
1870			1.01	1.26	1.10	1.28	1.30	1.24	1.12
1880		1.03	1.13	1.05	1.33	1.50	1.50	1.34	
1890	1.00	1.16	0.91	1.26	1.52	1.78	1.74		
1900	1.07	0.98	1.12	1.38	1.80	2.06			
1910	1.17	1.17	1.29	1.62	2.03				
1920	1.29	1.41	1.64	1.74					
1930	1.37	2.13	1.92						
1940	1.49	2.62							
1950	1.52								

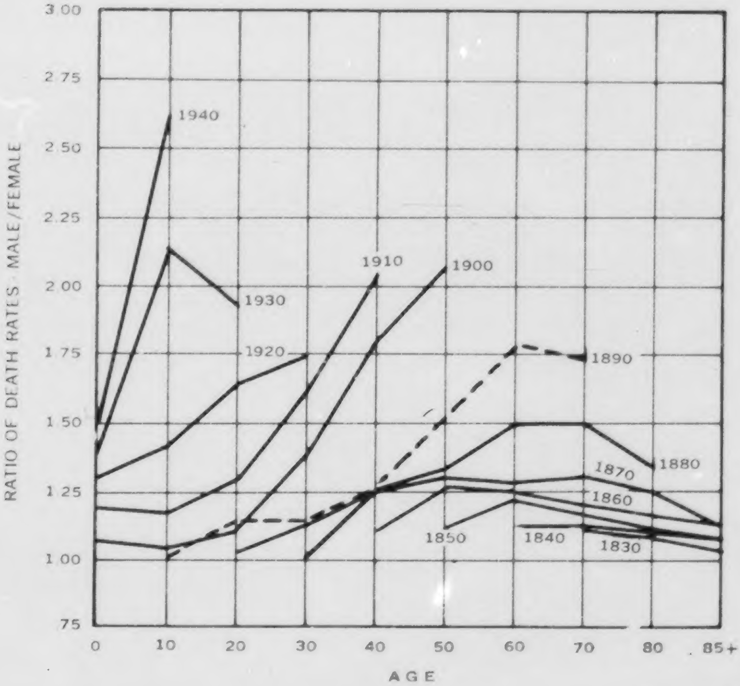
NOTE: Underlined ratios are based on data for 1920. Interpolated values between 1910 and 1930 ratios have been substituted in Figure 7.

Cohorts

Another means of studying the problem of sex differences in mortality is by an approximation of the cohort method which views mortality according to the experience of a generation of males and females. It assists in differentiating between the effects that age alone may produce in susceptibility or predisposition to a given phenomenon and the effects as related to the time-periods in which the generations lived.[1] Each generation is followed by using appropriate age-specific mortality ratios for each decade. For example, persons in the cohort for 1910 were actually born during the period 1905-15 and were 5-14 years of age in 1920, 15-24 years of age in 1930, and so on up to the latest figures available, i.e., 1960. Data available for use in this analysis date back to 1900; therefore, it is possible to follow some generations for only a few decades, particularly the most recent and earliest groups. For this reason, any conclusions must be considered tentative.

Cohort data for the United States, white race, are presented in Figure 7 and Table 4. To facilitate observation of the basic trends, interpolated values have been substituted in Figure 7 for male to female ratios based on 1920 data. This was done because 1920 ratios were apparently influenced by the 1918 influenza epidemic and did not follow the trend of the other years.

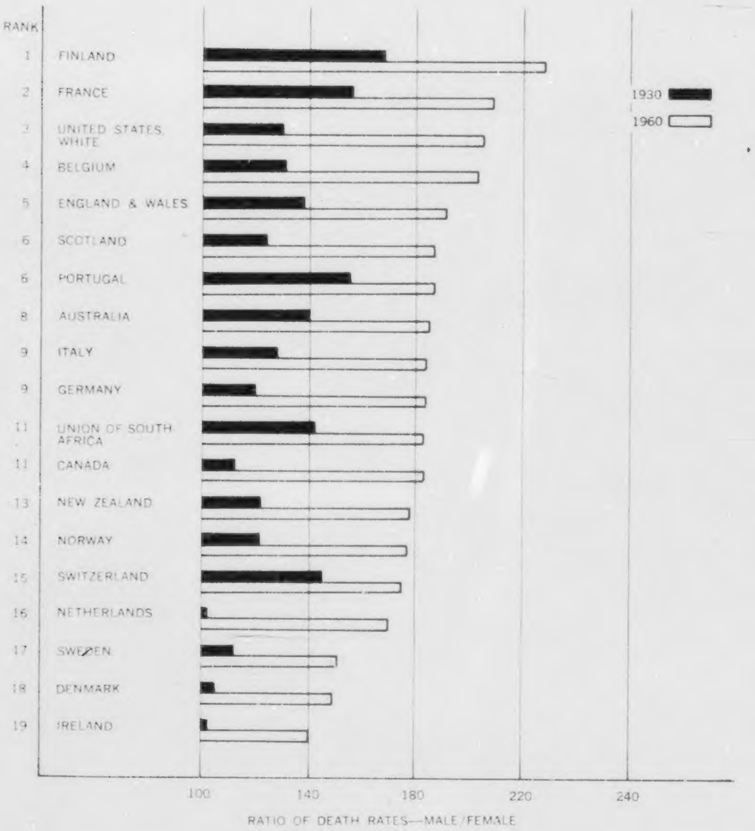
Fig. 7.—Male to Female Mortality Ratios by Cohort Birth Year, by Age, White Race, United States.



Their inclusion would result in zig-zag lines overlapping each other, thus making the basic trends difficult to follow. The substitute ratios fall between those for 1910 and 1930.

Figure 7 shows that the male to female mortality ratio was higher for each successive generation and also that the male excess mortality increased sharply at a younger age with each successive generation. The peak at ages 15-24 previously observed in age-specific data is non-existent for all cohorts prior to 1930. There is a peak at ages 15-24 in the 1930 cohort, but it is not as pronounced as was observed for 1950 and 1960 age-specific data (Fig. 3). Cohort data also do not show the pronounced peak at ages 45-64; they indicate a continued increase to an older age and then a decline more slowly than age-specific data. The cohorts for 1870 and 1880 show a decrease in male to female mortality ratio only after 75 years of age.

Fig. 8.—Male to Female Mortality Ratios for Persons Aged 45-64 in Selected Countries With Low Mortality by Rank Order, 1930 and 1960.



This appears to indicate that age is not the only significant factor in the excess of male over female death rates. The point in time when the generations were born also plays an important role. The later they were born, during the past hundred years, the more selectively they were affected. As stated in an earlier publication,[2] "since the older generations born before the period 1875-1900 showed no marked rise in excess male over female death rates, as they passed through the period 1900-1950, it could be postulated they were born too soon to be influenced by the factors which have caused the striking increase in excesses since 1900. Similarly, the generations born after 1875 would seem to have been particularly affected, and obviously the influence was exerted during their younger years. As far as the authors know, no biologic changes have occured that would have selectively affected mortality by sex during this time. However, marked cultural changes have taken place during this period. The hypothesis that these have in some way influenced the mortality of the sexes differently is apparently supported by these observations that older people born and reared in a different cultural milieu have remained relatively unaffected."

Other Countries

To supplement these findings, the experience of other countries having low mortality was investigated. These 19 countries revealed varying sex differentials and showed less change than that experienced in the United States between 1930 and 1960. The investigation was based on the age group 45-64 since this is a period in life where male to female mortality differences are great in the United States. Additionally, the years considered for the various countries were 1930 and 1960 because they provided a comparision between the generations born in 1866-1885 and 1895-1915.

The countries listed in Table 5 are ranked according to the size of the excess in male mortality in 1960. The rank in 1930 and the amount of change between 1930 and 1960 are shown also. These data are presented in Figure 8. They were adjusted for age distribution within the 45-64 year age group by using the 1950 U.S. Census population standard.

In 1930, the male to female mortality ratios ranged from 1.02 (Ireland) up to 1.68 (Finland) with a median of 1.28. In 1960, all countries had higher ratios ranging from 1.40 (Ireland) up to 2.28 (Finland) with a median of 1.56.

Finland and France had the highest male excess mortality at both periods of time while Ireland, Denmark, Sweden, and the Netherlands were consistently low. The greatest changes between 1930 and 1960 were noted in the United States (white),

Table 5.—Male to Female Mortality Ratios for Persons Aged 45-64 in Selected Countries With Low Mortality by Rank Order, 1930 and 1960.

Country	1960		1930		Change 1930 to 1960
	Rank	Ratio	Rank	Ratio	
Finland	1	2.28	1	1.68	0.60
France	2	2.09	2	1.56	0.53
United States, White	3	2.05	9	1.30	0.75
Belgium	4	2.03	8	1.31	0.72
England and Wales	5	1.91	7	1.38	0.53
Scotland	6	1.87	11	1.24	0.63
Portugal	6	1.87	3	1.55	0.32
Australia	8	1.85	6	1.40	0.45
Italy	9	1.84	10	1.28	0.56
Germany	9	1.84	14	1.20	0.64
Union of South Africa	11	1.83	5	1.42	0.41
Canada	11	1.83	15	1.12	0.71
New Zealand	13	1.78	12	1.22	0.56
Norway	14	1.77	13	1.21	0.56
Switzerland	15	1.75	4	1.45	0.30
Netherlands	16	1.70	18	1.02	0.68
Sweden	17	1.51	15	1.12	0.39
Denmark	18	1.49	17	1.05	0.44
Ireland	19	1.40	18	1.02	0.38

Belgium and Canada. The smallest change was in Switzerland where the male excess was 45 per cent in 1930 and 75 per cent in 1960. Thus, while there were differences in the male to female ratios and in the amount of change between 1930 and 1960, all countries had an excess male mortality and the difference increased during the 30 year period.

Disease-Specific Mortality

To further examine the pattern of change in the sex differentials in the United States, age-adjusted and age-specific death rates and mortality ratios are presented for the principal causes of death for the 30 year period, 1930 to 1960. The major cause groups to be considered are listed with their corresponding code numbers under the Sixth Revision of the International Statistical Classification of Diseases, 1949.

001-019	Tuberculosis (all forms)
020-138, 480-493, 763	Other Infective and Parasitic Diseases Including Influenza and Pneumonia
140-205	Malignant Neoplasms
260	Diabetes Mellitus
330-334 400-468, 592-594	Major Cardiovascular-Renal Diseases
810-835	Motor Vehicle Accidents
800-802, 840-962	Accidents, Except Motor Vehicle
964, 980-985, 963, 970-979	Homicide and Suicide

Table 6.—Death Rates for Selected Causes per 100,000 Population by Age and Sex With Male to Female Ratios, White Race, United States, 1930 and 1960.

Age	Death Rate				1960/1930 Ratio		Male/Female Ratio	
	1960		1930					
	Male	Female	Male	Female	Male	Female	1960	1930
Tuberculosis (001-019)								
Under 1	0.4	0.5	46.0	38.6	0.01	0.01	0.80	1.19
1-4	0.3	0.4	20.4	19.0	0.01	0.02	0.75	1.07
5-14	0.1	0.1	6.7	7.8	0.01	0.01	1.00	0.86
15-24	0.2	0.2	40.3	65.7	0.00*	0.00*	1.00	0.61
25-34	1.4	1.3	77.3	79.9	0.02	0.02	1.08	0.97
35-44	3.8	2.8	93.1	59.8	0.04	0.05	1.36	1.56
45-54	11.6	3.5	108.5	53.4	0.11	0.07	3.31	2.03
55-64	23.1	4.1	118.1	62.6	0.20	0.07	5.63	1.89
65-74	36.2	8.2	124.0	88.8	0.29	0.09	4.41	1.40
75-84	48.8	16.9	114.9	108.6	0.42	0.16	2.89	1.06
85+	56.8	22.8	74.5	72.2	0.76	0.32	2.49	1.03
Other Infective and Parasitic Diseases Including Influenza and Pneumonia (020-138, 480-493, 763)								
Under 1	300.7	219.0	1421.4	1181.3	0.21	0.19	1.37	1.20
1-4	18.8	17.4	218.9	200.5	0.09	0.09	1.08	1.09
5-14	4.1	3.7	41.3	37.3	0.10	0.10	1.11	1.11
15-24	4.4	3.6	42.2	28.4	0.10	0.13	1.22	1.49
25-34	5.3	4.9	50.9	34.1	0.10	0.14	1.18	1.49
35-44	10.7	6.7	93.2	49.5	0.11	0.14	1.60	1.88
45-54	26.3	12.9	151.8	77.1	0.17	0.17	2.04	1.97
55-64	63.7	28.5	236.2	151.1	0.27	0.19	2.24	1.56
65-74	166.2	78.5	405.7	346.9	0.41	0.23	2.12	1.17
75-84	444.4	292.6	888.4	917.5	0.50	0.32	1.52	0.97
85+	1338.4	1086.4	2088.2	2036.9	0.64	0.53	1.23	1.03
Malignant Neoplasms (140-205)								
Under 1	7.9	6.8	3.2	3.3	2.47	2.06	1.16	0.97
1-4	13.1	9.7	4.5	3.9	2.91	2.49	1.35	1.15
5-14	8.0	6.2	2.0	2.1	4.00	2.95	1.29	0.95
15-24	10.3	6.5	4.5	3.8	2.29	1.71	1.58	1.18
25-34	18.8	18.8	10.9	20.6	1.72	0.91	1.00	0.53
35-44	46.3	66.6	35.5	79.4	1.30	0.84	0.70	0.45
45-54	164.1	175.7	118.3	203.2	1.39	0.86	0.93	0.58
55-64	450.9	329.0	325.1	401.2	1.39	0.82	1.37	0.81
65-74	887.3	562.1	702.2	689.6	1.26	0.82	1.58	1.02
75-84	1413.7	939.3	1087.9	1028.4	1.30	0.91	1.51	1.06
85+	1791.4	1304.9	1285.9	1282.1	1.39	1.02	1.37	1.00
Diabetes (260)								
Under 1	0.4	0.3	0.6	0.4	0.67	0.75	1.33	1.50
1-4	0.3	0.3	1.4	1.7	0.21	0.18	1.00	0.82
5-14	0.2	0.5	1.9	2.2	0.11	0.23	0.40	0.86
15-24	0.7	0.9	2.8	2.9	0.25	0.31	0.78	0.97
25-34	2.6	1.8	3.4	3.3	0.76	0.55	1.44	1.03
35-44	4.7	2.9	5.2	7.0	0.90	0.41	1.62	0.74
45-54	10.9	8.7	16.5	27.8	0.66	0.31	1.25	0.59
55-64	29.5	37.2	53.9	102.2	0.55	0.36	0.79	0.53
65-74	75.1	105.4	120.7	191.7	0.62	0.55	0.71	0.63
75-84	146.9	179.6	169.5	204.9	0.87	0.88	0.82	0.83
85+	174.7	191.2	155.0	125.9	1.13	1.52	0.91	1.23

*Less than 0.005

Table 6. (Continued)

Major Cardiovascular-Renal Diseases (330-334, 400-468, 592-594)

Under 1	12.8	7.7	54,8	39.0	0.23	0.20	1.66	1.41
1-4	2.2	1.6	11.4	10.9	0.19	0.15	1.38	1.05
5-14	2.5	2.1	17.3	19.4	0.14	0.11	1.19	0.89
15-24	8.0	6.5	28.1	30.7	0.28	0.21	1.23	0.92
25-34	25.9	15.3	48.1	50.8	0.54	0.30	1.69	0.95
35-44	128.4	45.3	133.9	116.9	0.96	0.39	2.83	1.15
45-54	478.5	150.9	417.0	325.0	1.15	0.46	3.17	1.28
55-64	1263.5	520.4	1200.1	912.8	1.05	0.57	2.43	1.31
65-74	2998.0	1728.9	3163.8	2617.3	0.95	0.66	1.73	1.21
75-84	7029.2	5556.3	7661.1	6786.7	0.92	0.82	1.27	1.13
85 +	15977.8	14998.9	15089.5	13879.0	1.06	1.08	1.07	1.09

Motor Vehicle Accidents (810-835)

Under 1	8.8	7.5	8.6	5.7	1.02	1.32	1.17	1.51
1-4	11.3	8.3	18.5	11.8	0.61	0.70	1.36	1.57
5-14	10.3	5.2	20.9	9.4	0.49	0.56	1.94	2.22
15-24	62.7	15.6	44.1	12.3	1.42	1.27	4.02	3.59
25-34	38.6	9.0	38.8	9.0	0.99	1.00	4.29	4.31
35-44	28.4	8.9	36.7	9.3	0.77	0.96	3.19	3.95
45-54	29.7	11.4	46.9	15.9	0.63	0.72	2.61	2.95
55-64	34.4	15.3	63.4	24.1	0.54	0.63	2.25	2.63
65-74	45.5	19.3	93.4	40.2	0.49	0.48	2.36	2.32
75-84	66.8	23.8	124.4	52.0	0.54	0.46	2.81	2.39
85 +	61.9	22.2	155.0	37.6	0.40	0.59	2.79	4.12

Accidents, Except Motor Vehicle (800-802, 840-962)

Under 1	76.8	59.3	92.1	75.8	0.83	0.78	1.30	1.22
1-4	20.6	14.7	48.0	39.3	0.43	0.37	1.40	1.22
5-14	14.5	5.0	29.0	11.3	0.50	0.44	2.90	2.57
15-24	29.5	4.1	56.7	8.8	0.52	0.47	7.20	6.44
25-34	29.1	5.0	63.7	8.8	0.46	0.57	5.82	5.24
35-44	32.4	6.8	76.3	10.3	0.42	0.66	4.76	7.41
45-54	42.6	10.0	94.2	16.3	0.45	0.61	4.26	5.78
55-64	49.7	14.4	112.6	34.9	0.44	0.41	3.45	3.23
65-74	72.3	39.9	153.7	109.8	0.47	0.36	1.81	1.40
75-84	171.9	177.2	318.1	481.0	0.54	0.37	0.97	0.66
85 +	538.5	653.7	926.9	1582.5	0.58	0.41	0.82	0.59

Homicide and Suicide (963, 970-979, 964, 980-985)

Under 1	3.8	3.5	6.0	6.1	0.63	0.57	1.09	0.98
1-4	0.6	0.5	1.0	0.7	0.60	0.71	1.20	1.43
5-14	0.9	0.4	1.1	0.7	0.82	0.57	2.25	1.57
15-24	13.0	3.8	18.5	10.0	0.70	0.38	3.42	1.85
25-34	21.2	7.8	37.2	13.3	0.57	0.59	2.72	2.80
35-44	27.4	10.3	51.1	14.7	0.54	0.70	2.66	3.48
45-54	38.7	12.9	67.9	15.4	0.57	0.84	3.00	4.41
55-64	44.6	12.4	80.5	16.0	0.55	0.78	3.60	5.03
65-74	45.4	10.0	82.6	14.2	0.55	0.70	4.54	5.82
75-84	58.4	10.4	80.6	11.3	0.72	0.92	5.62	7.13
85 +	64.1	7.6	67.7	9.6	0.95	0.79	8.43	7.05

There has been a loss in continuity of the trend in mortality by cause of death as a result of six revisions of the International Classification of Causes of Death since 1900. According to the first five revisions, a fixed set of priorities was followed in selecting the cause of death to be tabulated when more than one cause was reported on the death certificate. With the sixth revision, however, when more than one cause of death was mentioned on a properly completed death certificate, the underlying cause of death designated by the physician was coded. In order to reconcile these revision differences, comparability ratios were computed by the National Office of Vital Statistics to be used as conversion factors to bridge the gap. Unfortunately, changes made in diagnostic practices and reporting procedures are factors that are present in the data to an undeterminable extent. Broad major categories of causes of death as presented here were selected so that the data might be examined with a minimum of concern as to the reliability of the classification during the interval of time, while, at the same time, being sufficiently definitive to be useful.

Death rates for these eight major cause groups by age and sex, with male to female morality ratios, for the United States (white race) for the years 1930 to 1960 are presented in Table 6. In addition a graphic comparison of male to female ratios for 1930 and 1960 for each of these causes is shown in Figure 9.

TUBERCULOSIS

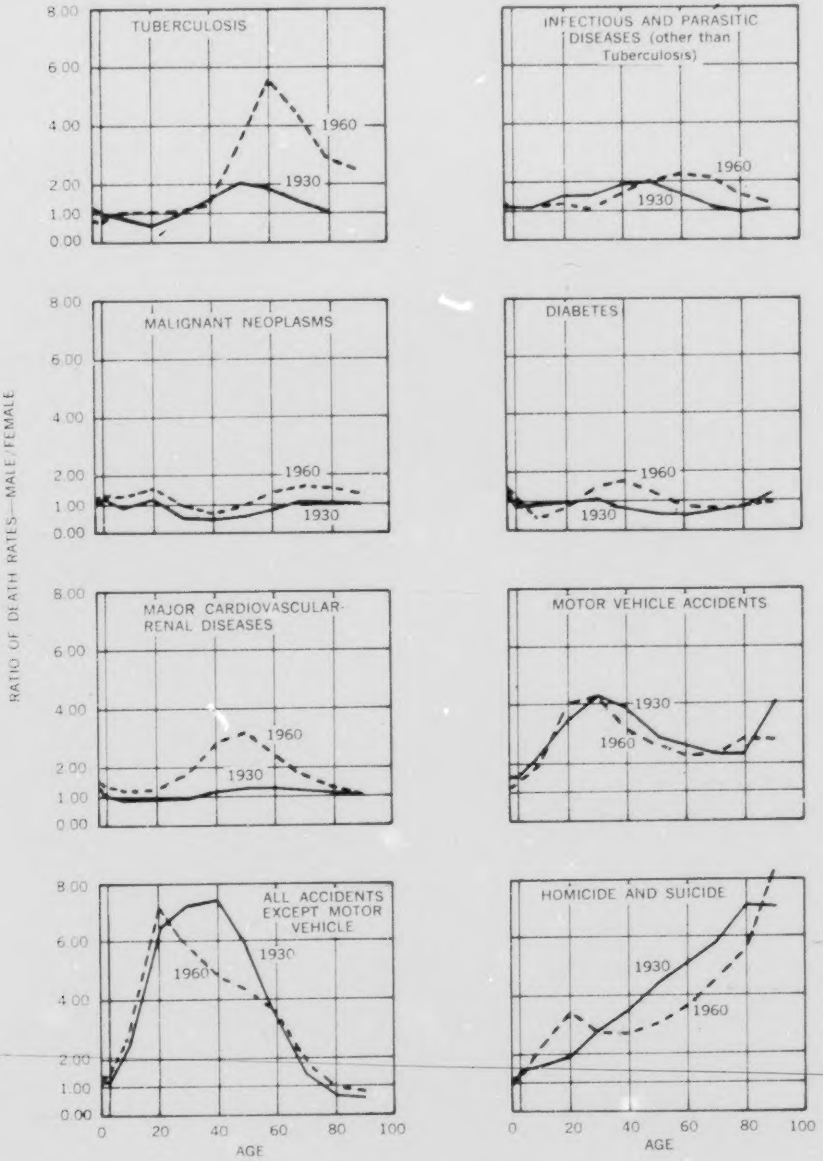
The substantial decrease in tuberculosis death rates in the United States since 1930 has been accompanied by a steady rise in the sex differentials. In 1930, the male excess was 23 per cent and in 1960, the male rate was over three times higher than the female rate (Table 7). The age distribution for tuberculosis deaths in 1930-1960 with the male to female mortality ratio is presented in Figure 9 and Table 6.

At the beginning of the 30 year period the male excess mortality was most prominent in the 35-74 year groups with male to female ratios ranging from 1.40 to 2.03. By 1960, death

Table 7.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Tuberculosis, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	6.8	2.2	3.09
1950	23.3	10.2	2.28
1940	44.0	27.9	1.58
1930	66.4	54.1	1.23

Fig. 9.—Mortality Sex Ratios for Selected Diseases, by Age, United States, White Race, 1930 and 1960.



rates for all ages under 45 years had decreased at least 95 per cent with little change in male to female ratios. However, in ages 45 and over, decreases in female death rates were not matched by decreases in male rates and the mortality ratios increased greatly with a high of 5.63 in the 55-64 year group.

OTHER INFECTIVE AND PARASITIC DISEASES INCLUDING INFLUENZA AND PNEUMONIA

The age-adjusted death rates for males and females from the infectious diseases, with the percentage excess male over female mortality at 10 year intervals in the United States, are shown in Table 8. Included within this category are typhoid fever, diphtheria, whooping cough, measles, dysentery (all forms), meningococcal infections, influenza and pneumonia, acute poliomyelitis, and syphilis and its sequelae. As shown in the table, the percentage excess of male over female mortality increased from 31 per cent to 59 per cent between 1930 and 1960 while mortality rates for males and females decreased almost 80 per cent.

A female excess mortality existed for whooping cough, but this did not affect the male emphasis within the group of diseases as a whole owing to the relative insignificance of the whooping cough death rates. In 1930, the death rates for males and females for this disease were 3.3 and 4.0 per 100,000 population, respectively, and in 1960, the male, 0.1, and female, 0.1. Syphilis was the largest contributor to the total mortality rates for this group and determined to a large extent the sex differential for the entire group.

Figure 9 and Table 6 show the age-specific death rates and the male to female mortality ratios in 1930 and 1960 for this group of diseases.

The highest death rates occurred at "Under 1," when infants are least able to withstand whooping cough, measles, dysentery and meningococcal infections. Beyond middle age, the syphilis death rate rose considerably for the males and

Table 8.—Age-Adjusted Death Rates per 100 000 Population and Ratio of Male to Female Mortality, Other Infective and Parasitic Diseases Including Influenza and Pneumonia, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	36.4	22.9	1.59
1950	35.7	23.4	1.53
1940	92.0	67.3	1.37
1930	149.6	114.6	1.31

Table 9.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Malignant Neoplasms, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	141.6	109.5	1.29
1950	130.9	119.4	1.10
1940	117.7	125.5	.94
1930	104.6	126.6	.83

caused the high excess mortality for the group. The percentage excess male mortality, however, decreased during the period for ages 15-44 and there was no essential change in the ratios for ages 1-14. In 1960, the highest male to female mortality ratio was 2.24 in the 55-64 year group.

MALIGNANT NEOPLASMS

The trend in mortality ratios for malignant neoplasms in the United States since 1930, based on age-adjusted death rates, has been a shift from a female excess for two decades to a male excess in 1950 and 1960 of 10 and 29 per cent, respectively (Table 9).

Age-specific data for the 30 year period show that the male death rates for every age group increased in amounts ranging from 26 per cent in the 65-74 year group up to four times the 1930 rate in the 5-14 year group (Fig. 9 and Table 6). During the same period, female death rates decreased for all ages between 25 and 84 and had smaller increases than male rates in the other age groups. This resulted in a trend toward higher male to female mortality ratios at every age. In 1960, male mortality was higher for all ages under 25 and over 54 with the highest ratios (1.58) being recorded at the 15-24 and 65-74 year groups. Male and female death rates were the same in age group 25-34 and there was an excess female mortality in ages 35-54.

While the mortality ratios are not as high for malignant neoplasms as they were for tuberculosis and other infective diseases, they have a greater effect upon population composition because of the magnitude of the death rates. Cancer is the second leading cause of death.

DIABETES MELLITUS

Diabetes has been an outstanding exception to the general rule of excess male mortality. This disease has been constantly characterized by higher female death rates, but the differences have shown a decrease in the last decade. The male to female ratio of age-adjusted rates was .65 in 1930 and had changed to .69 by 1950 (Table 10). However, in 1960 the male death

Table 10.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Diabetes Mellitus, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	11.6	13.7	.85
1950	11.3	16.4	.69
1940	20.6	32.8	.63
1930	17.7	27.2	.65

rate was slightly higher than it was in 1950 and the female death rate dropped to produce a .85 ratio. The 1949 revision of disease classification procedures caused drastic changes in the diabetes totals, making it difficult to compare time trends.

Age-specific data for diabetes are presented in Figure 9 and Table 6. In 1930, female death rates were higher than those for males for every age group except under 1, 25-34, and 85 and over. In 1960, male rates were higher in age groups under 1, 25-34, 35-44, and 45-54. The male to female ratios were higher for ages 55-74 but lower in ages under 1 and above 74 than they were in 1930. Diabetes death rates under age 25 were extremely small and differences shown may not be significant.

MAJOR CARDIOVASCULAR-RENAL DISEASES

The major cardiovascular-renal diseases account for more than half of all deaths and are therefore most important in a mortality study. Age-adjusted death rates show a male to female ratio of 1.19 in 1930 which steadily increased to 1.69 in 1960 (Table 11). This was the result of a decrease in the female death rate of 32 per cent in 30 years, and an increase in the male death rate between 1930 and 1940 and thereafter a decrease in a much smaller amount than the rate for females.

The distribution of death rates and male to female ratios by age for 1930 and 1960 are presented in Figure 9 and Table 6. During the 30 year period, female death rates decreased for every age under 85 years while male rates increasd for ages 45-64 and 85 and over. They decreased less than female rates

Table 11.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Major Cardiovascular-Renal Diseases, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	493.2	291.5	1.69
1950	514.1	339.0	1.52
1940	535.3	402.6	1.33
1930	509.1	428.9	1.19

for the other ages. As a result, male to female ratios were higher for ages under 85 with the male rate being over three times higher than that for females at ages 45-54. These higher male rates for all ages over 35 contribute heavily to the decreasing proportion of males to females in the older population.

MOTOR VEHICLE ACCIDENTS

There was a large male over female excess mortality from motor vehicle accidents in the United States during the period 1930-1960 with very little change in the ratio (Table 12). The age distribution of death rates and male to female ratios for 1930 and 1960 are shown in Figure 9 and Table 6. It is surprising to note that death rates for motor vehicle accidents decreased during the 30 year period for all age groups except under 1 and 15-24. Death rates for white males age 15-24 went up 42 per cent whereas rates for white males age 55-64 went down 46 per cent. Death rates for males exceeded those for females at every age group with the greatest differences in the 15-24 and 25-34 year groups where the male rates were over four times higher. Male rates were over three times higher in the 35-44 year groups. The smallest difference was for infants under 1 year where the male rates were 17 per cent higher in 1960.

Table 12—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Motor Vehicle Accidents, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	34.0	11.1	3.06
1950	35.9	10.6	3.39
1940	40.2	12.2	3.30
1930	42.0	14.2	2.96

ACCIDENTS, EXCEPT MOTOR VEHICLE

During the period 1930-1960, age-adjusted rates for deaths resulting from accidents other than motor vehicle for both males and females decreased more than 50 per cent (Table 13). The mortality ratios between males and females did not change greatly—2.33 in 1930 to 2.53 in 1960. A review of age-specific death rates indicates a drastic reduction in figures for all age groups

Table 13.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Accidents, Except Motor Vehicle, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	36.5	14.4	2.53
1950	45.0	20.0	2.25
1940	59.9	30.7	1.95
1930	76.4	32.8	2.33

and both sexes (Table 6). Between 1930 and 1960, female death rates showed greater reductions than male rates in all ages under 25 and over 54, while male rates dropped more than female rates in the 25-54 year range. This resulted in decreased mortality ratios in the 25-54 year olds and increased ratios for all other ages (Fig. 9 and Table 6). The greatest difference was in the 15-24 year group where the 1960 male rate was over seven times higher than the female rate. In 1960, male rates were higher than those for females for all ages under 75.

HOMICIDE AND SUICIDE

As would be expected within this category, death rates due to homicide and suicide have shown a consistently high male excess with male rates being over three times higher than those for females (Table 14). Suicides compose the larger portion of this cause group.

Age-specific data are presented in Figure 9 and Table 6. They show that, in general, the male to female ratios increase with age. During the period 1930-1960, ratios increased in the 5-24 year range and for those over 85. Decreased ratios were recorded for ages 35-84. In 1960, the male to female ratio reached a peak of 3.42 at ages 15-24, dropped to 2.72 at ages 25-34, to 2.66 at ages 35-44 and then increased rapidly to a ratio of 8.43 at ages 85 and over.

Table 14.—Age-Adjusted Death Rates per 100,000 Population and Ratio of Male to Female Mortality, Homicide and Suicide, United States, White Race, 1930-1960.

Year	Death Rate		Male to Female
	Male	Female	Ratio
1960	21.4	6.7	3.19
1950	22.0	6.7	3.28
1940	28.1	8.5	3.31
1930	36.9	10.3	3.58

Life Tables

The effect within a population of the increasing sex differentials by age can be shown by the Life Table method of determining the composition of a population at a given time. The distribution of the sexes within a stationary population of 100,000 persons is arrived at by utilizing the ratio of male to females at birth and the age-specific death rates for each sex. The assumption is made that there is no migration.

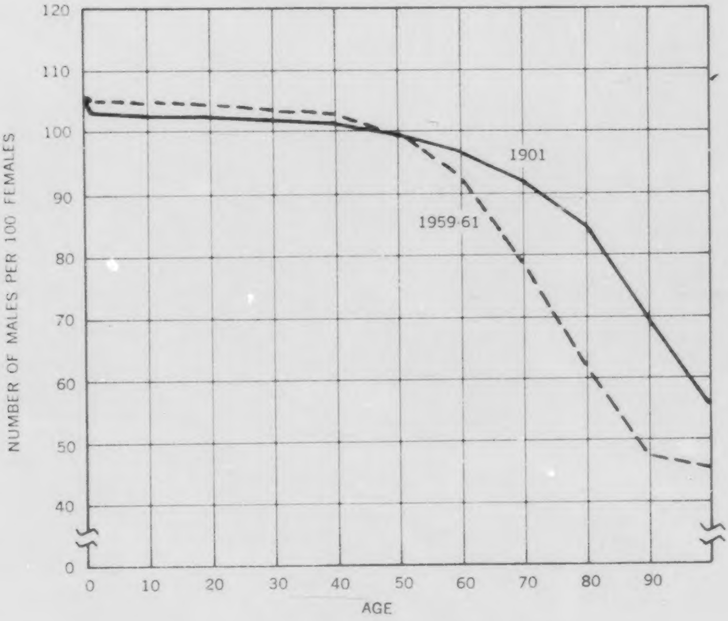
An examination of births in the United States for a 20 year period revealed that the proportion of males to females remained almost constant at 51.4 per cent and 48.6 per cent, respectively. Thus, populations of 51,400 males and 48,600 females formed the basis for the calculations, a ratio of 105.8 males per hundred females. These initial populations were reduced according to the mortality rates at each year of age in 1901 and 1959-1961. The number of males and females remaining in the population at each year of age was compared to determine the male to female ratios plotted in Figure 10.

In the stationary population based upon 1959-1961 death rates, the 105.8 males per hundred females at birth dropped to 105.1 at the end of the first year of life; then the ratio decreased very slowly until it was 102.5 at age 40. During age 49, the number of males became equal to the number of females. After this age, rapidly increasing death rates combined with high male to female mortality ratios through age 74 resulted in an ever increasing excess of female population with each year. At age 60 there were 92.5 males per hundred females, at age 70 there were 78.5, at age 80 there were 61.5, and there were only 47.6 at age 90 in this hypothetical population.

Data based on the 1901 death rates reveal a similar relationship between males and females with two important differences. First, infant death rates were less favorable to the male than in the 1959 period with the result that there was a greater reduction in the male to female ratio during the first year of life. At age 1, the ratio was 103.0 males per hundred females. Consequently, the male and female populations became equal during the 45th year, four years earlier than for the 1959-1961 data.

The second important difference between the two periods is that beyond age 50 the proportion of males to females did did not decrease as rapidly as with the 1959-1961 data. At age 60, there were 96.6 males per hundred females, at age 70 there were 91.9, at age 80 there were 84.4, and there were 69.1 at age 90. Beyond middle age the depletion of the male population was much more rapid in the later period. This indicates that women somehow have been able to take better advantage of the changing factors which lead to longer life.

Fig. 10.—Number of Males per 100 Females in Stationary Population, by Age, Based on United States Life Tables for White Race, 1901 and 1959-1961.



Summary

1. Death rates for females are lower than those for males and they also are decreasing at a greater rate. This has resulted in a progressively widening gap between male and female rates.

2. Data for nonwhites show a similar trend with death rates at a higher level although differences are not as great between male and female mortality.

3. Male to female mortality ratios have been increasing at all ages with the greatest increases in ages 15-24 and 45-64. The differences have accelerated since 1930.

4. Cohort studies indicate that cultural changes since 1875 have in some way influenced the mortality of the sexes differently.

5. The trend in England and Wales is very similar to that of the United States except mortality ratios in ages 15-24 have increased more rapidly in the United States.

6. A comparison of the United States and 18 European and British Empire countries shows all have higher male death rates with the mortality ratios ranging from 1.40 (Ireland) to 2.28 (Finland). The United States had the third highest ratio in 1960 and had the greatest change since 1930.

7. Causes of death showing the largest sex differentials were: tuberculosis for ages 45 and over, cardiovascular-renal diseases for ages 35 to 64, motor vehicle accidents for ages 15 and over, other accidents for ages 15 through 64, and suicides for ages 15 and over.

8. Causes of death showing the greatest change in mortality ratios since 1930 were: tuberculosis for ages 45 and over, and cardiovascular-renal diseases for ages 35 through 64.

9. Because of the high death rates and the high male to female mortality ratios, the cardiovascular-renal diseases in ages 45-64 are having the greatest effect upon the sex composition of the population.

10. Life Table studies based on 1960 U. S. white death rates show that at age 70 in a stationary population, there would be 125 females per 100 males.

11. The problem of the widening sex differential in mortality is worthy of serious research. Under present conditions, the trend of greater proportions of men than women dying at their prime of life could ultimately alter the entire complexion of our society.

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Working for Death

EDWARD L. FLEMMING, ED. D.

The cartoonist portrays death as the grim reaper who stands in his dark shroud welcoming, with a satanic smile, those who are caught in his swath. According to the material presented in this monograph, death must burst into raucous laughter as he meditates upon the eagerness with which the human male struggles to be mowed down. Death need not work; he sits and waits for his enthusiastic male followers to join his force. This eagerness on the part of the male for death is quite recent and in the past 40 years he has made tremendous strides in outdistancing the female. Apparently the female considers life more important than death and has relaxed her efforts saying, "No longer will I seek death out - - if he wants me, he can work for me."

Many speculations have been made upon the fact that women are ill more frequently, spend more time in doctors' offices, and suffer more disability from illness; but the "healthy male," when he is sick, is more sick and more likely to die. Such speculations suggest that men ignore many of the warning signs which are the precursors of death through illness or, perhaps, the male has a certain characteristic which is coupled with a "one horse shay" quality which leads to total collapse rather than gradual deterioration. Maybe sickness and death are of a completely different genesis and really stand far apart in their effect upon the organism. Too little is known of their actual relationship to each other. These speculations, rhetorical and otherwise are but a few which are brought to mind as we ponder on the increased excess in death rates of the male over the female. Speculations on the state of the world, if the male population continues in its present trend toward death in the prime of life, would make for interesting discussion but little realistic appraisal of the problem.

Possible Explanations for Greater Male Mortality

A more realistic approach would be to set some hypotheses and appraise their tenability.

The first hypothesis might be stated: The highly competitive life of the American male results in the excess male death rate. This hypothesis would be refuted by the fact that this same phenomena is occurring in 19 foreign countries, not all of which are peopled by the "rigid, competitive, hard driving" Anglo-Saxon strain.

A second hypothesis might be: The human female has developed new anthropological adaptations which prolong her life.

This hypothesis must be rejected since anthropological adaptations do not occur within so short a time as 50 years. Thousands of years are required. Although it might be possible to label this an adaptation which is really the culmination of a process which has been going on for milleniums and has not been as noticeable as the decline of the appendix, the little toe, and the coccyx, such labeling would be pure conjecture.

A third hypothesis: The older male is not essential to the survival of the species. The young male who can plant healthy seed is biologically necessary. Certainly this hypothesis is tenable. Perhaps there is no place for the older male, be it in a pride of lions, a crowd of baboons, a hive of bees, or suburbia. Yet, why would nature demonstrate this discard of the older male in all age groups?

A fourth hypothesis: There is a basic sex difference in susceptibility to illnesses having the highest death rates. Although this too is tenable, we must wonder why the sex difference has waited so long to show itself so dramatically in the development of man as a complex organism. It seems quite impossible that the female has become the stronger. Better medical care and better environment are a feasible explanation, but health improving measures of both have been available to male and female alike. Even if the male ignored accessible medical care, the improvements in living standards of the past 60 years have been utilized by both sexes.

The fifth hypothesis: The psycho-socio-cultural milieu has become relatively more favorable for the survival of the female. This hypothesis is supported by such men as Sowder,[1] Hinkle,[2] Wolff,[3] Caudill,[4] and others, and seems the most possible to explore. Certainly the most marked changes in our way of life (in the past 60 years) have been in the psycho-socio-cultural milieu.

In exploring this hypothesis let us first consider the psychic factors which seem to be, at least, partially involved in the development of some of those diseases previously mentioned in this monograph in which there is an excess of male death rate over female death rate.

Psychic Factors in Disease Entities

Hartz[5] indicates that pulmonary tuberculosis can be as much a disease of the personality as it is of the lungs. Friedman et al.[6] found strong obsessive compulsive traits and a marked resentment toward authority characteristic of the tuberculosis patients whom he studied. Merrill[7] in writing of the tuberculous patients states ". . . these patients have a strong infantile need to be the passive recipients of affection. The reaction formation to this takes the form of obsessive compulsive character traits." Day[8] observes that these patients have a strong insistence on independence as a cover up for their anger about early deprivations. He feels that they are so afraid of their passive dependency longings that they carry out self-destructive acts such as exposing themselves to infections, neglect of rest, and personal hygiene.

It is possible to continue to draw from the literature in illustrating psychic involvement in tuberculosis but the rather definitive collection edited by Sparer [9] reinforces the previous findings to a point where it is believed that little further proof is needed. The studies could be summarized as describing tuberculous patients as individuals who are under stress because of their needs for love and their concomitant fear of the demonstration of love toward them. This conflict leads to impossible demands for self perfection. In simpler terms it appears that the tuberculous patients want to be dependent, fear that they might become dependent and spend all their lives proving that they are so independent that they need no one.

The cardiovascular-renal diseases are expanding their net and trapping more and more men. In speaking of this problem Wolfe [10] reports "anxiety is the central problem." He goes on to say, "We may find some day that anxiety is the central problem in organic disease also." Dunbar [11] writes in his discussion of Van Dellen et al[12], "All varieties of character and neurotic disturbances occur in the hypertensive persons, but inhibited aggression seems to bear the most consistent relationship to this symptom." Here we find hostile aggression, a typical reaction formation to conflict between independence and dependence as the psychic symptom.

Regarding the epidemic diseases, Emerson [13] states, "The bacteriologist no longer teaches that bacillus typhosa is the 'cause' of typhoid fever, nevertheless the chain of etiology of other levels also name 'immunity, resistance, susceptibility,' etc. And these, he knows, the affective psychical states of the patients can easily modify."

Dunbar [14] states, ". . . in epidemics there is always a large percentage of those exposed who do not succumb to the disease. It is said that some people have a higher resistance to infection than others. This resistance, however, cannot be explained always in terms of immunization. Resistance to disease is greatly modified by such factors as fatigue and the general physiological equilibrium of the body. Experiments have shown that emotional tension seriously limits the ability of the body to regain a stable equilibrium after it has been subjected to stress or injury." In discussing emotional tension Hinkle and Wolff [15] state, "Man is an independent living system—the integrity of the system is dependent upon a dynamic equilibrium among the molecular configurations which make up the cells and upon the maintenance of the general integrity of the larger configurations which make up the organ systems . . . . disturbances in the psycho-social environment add energy to the system, subtract energy from it or initiates some process which alters the energy exchanges within it."

Dunbar[16] cites three cases with the cold habit which illustrate this point.

1. "A married girl of 24 with chronic colds relates the hostility she felt toward her mother-in-law for her constant criticism. Out of respect for her husband she choked down her anger but had gone on seething inside. The cold was the result. Anger has upset the delicate chemical balance in her body, opening the way for the infection which led to the cold.
2. "A man suffering with chronic colds ' . . .covered his petulance with a great show of independence; but underneath he was still the spoiled child wanting everything done for him. He resented the responsibilities of being a husband and father, but he pretended to take everything in his stride.'
3. "A 31 year old engineer with chronic colds ' . . . had been the youngest child of a large family, and his brothers and sisters had always made him feel physically and intellectually inferior to them. He had responded by trying to beat them at their own game, forced his way through school in record time and, after a few false starts, landed a fine job. . . . but he continued to feel as inadequate as he had felt as a child'."

Dunbar[17] further states, "Everything that has been said about the susceptibility to colds and the cold habit applies with equal force to bronchitis and pneumonia. . . other things being equal, patients who succumb to pneumonia are usually found to be under particular emotional stress."

Like the epidemic diseases, the illnesses of the gastrointestinal system produce, as causative factors, feelings of inferiority, conflict over independence versus dependence and repressed hostility. Mittelmann and Wolff[18] indicate that the rising trend of these afflictions might be attributed to the increase of noxious factors in the social environment and he believes that there is reason to believe that these factors affect more males than females.

Sidney Rubin contributed to Dunbar's[19] notes, ". . . the wish to be loved, strivings for security, the feelings of insecurity, possessiveness, greed, jealousy, and envy, all become linked with hunger and the process of nutrition. This indicates the close connection of emotional factors in disorders of the alimentary functions. Whenever deep emotions are repressed and blocked from expression through voluntary behavior, a state of permanent tension results and may exert a chronic disturbing influence on the different phases of gastrointestinal activity."

In analyzing Alexander's [20] work Rubin writes, "In general, in all patients suffering from pathogenic gastric disturbances, the repressed, possessive, receptive, help-seeking, dependent tendencies play a prominent role. A strong fixation to the early dependent situation of infancy is generally present. This dependency is not acceptable to the adult ego. The pride of the adult ego is hurt through denial of the wish for independence and self assertion, and as a consequence the dependency feelings are repressed."

In further discussion of Alexander's [21] study of emotional factors relating to peptic ulcers, Rubin continues, "the typical conflict noted was between the wish to remain in the dependent infantile situation and pride and aspiration for independence, accomplishment, and self sufficiency. The difficulty, therefore, expressed in other terms, revolves around the desire to be loved and cared for, and the rejection of this desire by the adult ego . . . deeply hidden, however, is the person's unconscious longing for the sheltered existence of the little child. This dependent attitude must be carefully hidden and this cannot find an expression in overt behavior. The more the patient strives for independence and responsibility, the stronger is his unconscious desire for childhood satisfactions."

Even in the malignant neoplasms there seems to be a very real possibility that psychic factors contribute to the disease entity. It has been said that the endocrines translate the tempo of the nervous system into the tempo of metabolism and vice versa. Our present knowledge about endocrines and metabolism is unsatisfactory. Perhaps, all that can be said with certainty is that they are closely linked, and that disturbances in either are occasioned by minor or major dysfunction of other organ systems in which these physiological and psychological factors are better understood. Perhaps even here we may find factors which are responsible for the sizeable increase of male over female deaths. Chapman and Hinkle [22] reinforce this concept when they state, "Neural activity involving the segmental, brain stem, and cortical levels can modify reaction to noxious stimulation in the peripheral tissues so as to augment or suppress inflammation and tissue damage. A change in attitude may thus increase or decrease inflammatory reactions and tissue damage through local alterations with changes in body tissue."

Accidents of one type or another kill far more men than women and the rate differential is rapidly increasing in favor of the male—over 35 per cent in the past 25 years. Some would tend to minimize this increase by saying that women are not exposed to hazardous situations. Yet, we know that the home is one of the biggest sources of accidents, and women certainly spend far more time in the home than most men.

Dunbar[23] says, "The area of conflict of patients with the accident habit like those suffering from cardiovascular diseases is in the realm of authority, but unlike the patient with cardiovascular disease, the accident prone patient's characteristic reaction to his conflicts, or manner of dealing with them, is to strive for independence and autonomy outside authority relationships and to avoid conflicts . . . When the characteristic defenses fail, and conflict with authority becomes unavoidable, the accident happens; that is, aggressiveness breaks out in an impulse to punish both the individual himself and those responsible for his frustration."

It would be possible to go on and on in our search of the literature which presents evidence showing more and more conclusively that psychic factors are a component of all disease entities. This probably would be a continued proving that "water is wet." In all of the diseases which seem to be leading to an increased mortality of the male over the female, there is a continuing psychic theme. This recurring theme encompasses the struggle for independence and the rejection of dependence conflict with the authority figure, and the passive-dependent love relationship with mother.

Psychic-Social-Cultural Phenomena

There is striking evidence that those diseases showing the most marked increase in the male death rate have as a root conflict between the need to be dependent and the need to be independent and/or other psychic symptoms.

Passive dependency and an active independence are closely tied to responsibility. Dependence or the looking to another to be told how to think, act, and feel (Hinkle's mood, thought, and behavior) places no responsibility upon the individual other than he maintain the passive role and keep alive the nurturing relationship. Independence or the looking within one's self for cues to action, thought, and feeling positions complete responsibility upon the individual, demanding that he accept the brunt of negative as well as positive response to his mood, thought, and behavior. These extremes in dependence and independence might be compared to the perigee and apogee of swings from the parent mass, be it the earth, the society, or the family. Either of these modes of existence makes tremendous demands upon the individual. On the one hand, he must completely deny himself freedom and, on the other hand, resist all encroachment upon his freedom. This predicates the expansion of energy in repression or aggression. Either of these reactions is uneconomical; The energy lost in the maintenance of the role or the conflict resulting from the fear of not being able to maintain the role is siphoned away from other body functions. Thus, instead of self responsibility being worn comfortably, as an ever recurrent and disciplined spontaneity, it is worn as a hair shirt, becoming a chronic source of tension and resultant anxiety. And so, man seems engulfed in his own conflicts about dependence (submission), independence (freedom) and the wish for, but fear of, responsibility.

Fromm [34] suggests that modern man's dilemma stems from his desire to escape from the obligatory responsibilities of the freedom which he has purchased by rejecting any and all dependency ties. On the other hand Meyer [35] feels that in the modern ideal of freedom, man assumes responsibility as a dictate of dogma rather than as dictate of the best possible wisdom, facts and opportunity for betterment. In other words, modern man may see responsibility as a cross, rather than a just reward for manhood.

This vacillation between infantile dependence and adolescent independence makes us wonder about the possibility of healthy maturity in the modern male. Is it possible that most men never reach maturity but spend much of their energy trying to resolve the conflict of the role demands of manhood and their need to be suckling babes? Perhaps rebellious adolescence is one expression of this conflict. Is this vacillation reflected in the boom in tobacco and alcohol industries (the satiators of the suckling impulse) and the immature competition in business, industry, and politics?

Meyer [36] notes:

> "The questions that set me pondering over our American standards of maturity are first, the difficulty of knowing (with our widely differing economic, denominational, and largely success determined origins) when maturity will begin and by what we can judge and measure it! The individual is powerless against the atmosphere created by the financial success standards ruling the printing press, the movies, the automobiles, the fashions in drink, and all the other ubiquitous problems for the immature, whether adult or younger. Is not maturity a relative and still progressive attainment even in the adult? Does not all maturity have to be maturity for something?"

And for what is modern man to become mature? If man attempts to become "mature" for living there are stumbling blocks placed in his way, making the attainment of maturity not a wholly desirable thing. Business and industry, unions, farm cooperatives, and craft guilds, cry loudly that they want mature individuals. But is this really so? Would a "mature" human being fit into the pattern of the "company or union man?"

Maturity, like happiness, is an intangible that is known not as an entity by its expressions. Meyer[27] writes:

> "Expressions of mature living are the balancing of expectation against reality, and the capacity to fit into groups: in business, in home life, with its non-sexual affection as well as with its visions of sexualization; in our allegiances as well as in our emancipation. It implies the capacity to accept illness, disappointments, bereavements, even death, and all that which is largely beyond our own control and influence: to accept our own make-up, the perfections and imperfections of self and others, success and failure, sportsmanship and the social comparisons we call advice, criticism, and authority. Finally, maturity requires a capacity to recognize limitations without being hindered in using what one is and what one has: a realization that there are grades and stages of adequacy, and where the more obvious grades and stages of growth and education have been allowed for, there are still fluctuations of efficiency. It includes the capacity to appreciate one's place in the scale and to sustain the tension needed to attain one's ends. We have to realize that all of us have to attain certain conditions, if we are to obtain what we wish. We have to maintain a certain degree of an ever-present holding to a tenor or pitch, to keep an average for action as well as for rest, and for what we assume ourselves subject to in the direction of let-down or of rise."

Meyer's statement predicates that man must know who he is, how he feels, thinks, and acts, reconciling the reality of himself with the inculcated "ideal" of himself if he is to ever express himself as a mature person.

Perhaps the greatest socio-cultural change occurring in the past 60 years has been the development of the present form of industry, government, and labor. All have developed through cooperative and union policies, government edicts and protectionism, what some authors deign to call "paternalistic attitudes." In reality, business, industry, labor, and govermental organizations are far more "maternalistic" than "paternalistic." These organizations have taken it upon themselves to "mother hen" the millions of people for whom they are responsible.

Let's take another look at the role of the mature mother. She cares for the child's every need until she feels that he is ready to stand on his own. This physical and psychological weaning takes about 20 years; then he becomes "mature." She tries to satisfy his needs during the dependent years when she acts as the authority figure, establishing and helping him to accept her controls on his feelings, thoughts and actions. She recognizes that he has many negative feelings such as hate, fear, rage, envy, and jealousy; yet she must help him understand that he cannot always express these feelings in overt action. She knows that he thinks and tries to establish guideposts for his thinking. She knows that he wants to do many things but she must help him to recognize that many times she must forbid action because it would lead to pain, anguish, or even death.

The child struggles for independence and the mother gradually releases her controls on his mood, thought, and behavior letting him try out and develop his own set of standards on his feelings, thoughts, and actions.

The mother stands the incessant demands of the dependent years and the aggressive confusion of the independent years with forbearance and love. During the entire weaning process she tries to help the child determine who he is and what he should do. In essence she tries to help him define himself as a human being who can face the realities of his strengths and limitations. As the child hunts for this definition, there is always an undertone of love and warmth for a mature mother really wants her child to become mature for life.

About the time the child is seriously considering his self ideal and goal in life, he has reached the point where he is completing his trade training or college education. He presents himself on the doorstep of business, industry, labor, or government. In fact these organizations seek out bright young graduates with the tenacity of childless parents seeking a precocious infant for adoption. It would be possible to make the mistake of saying that at least college graduates are given some choice in their decision as to what they will do, but actually they have little more choice than the apprentice in deciding his union affiliation. The college graduate can decide what corporation he wishes to favor but so can apprentices once they have their union card. Nor are the "professionals" exempt from this "union affiliation." No professional dares to ignore the call of his "union" and its controls. So degrees notwithstanding, the bright young man is chosen, or pledged, or impressed.

Then what happens? The male, and perhaps the male-competitive female, when he has reached the point of grasping maturity, is returned to the dependency state of his early childhood. Business, industry, labor, and government through their organizations and policies demand that their controls on feelings, thoughts, and actions be accepted without question. However, instead of the love and forbearance of a mother there is now the threat, "If you don't do things our way you will be fired" or in psychological parlance, "deprived of your security."

Now it might be asked, and justifiably so, how do these assorted organizations return the male to the dependency role of the infant? The male is told what to think about the organization, its products, politics, social aspects and enemies. It further demands that his thoughts on all things, professional and personal, not deviate too far from the accepted organizational thinking. If he does indicate any reluctance to accept organization thought, he is soon weeded out as a "liberal," "troublemaker" or "Communist." The term is incidental—the fact is, he refused to conform.

And then his feelings (moods)—how about these? The organization cannot make him feel any way except insecure. He is told that he should believe that the organization is right whether it is trying to mulct the public, persuade people to spend their money on useless nonessentials or deprive people of their rights and comforts. The fact that the organizational policy is contrary to the law of God or the principles he may have been taught is unimportant. The male must toss aside old truths with no feeling of wrongdoing. As long as the organization feels that its "morality" is right—it is right. The male had better not feel differently.

Then his behavior or action: where he lives in the world and in the city is decided for him. The length of time he will remain in one locality, the type of clothes he wears, his personal appearance, friends, associates, social behavior, etc.—all these are decided for him. Whyte in his book, "The Organization Man," defines the role of the organization in the male's life with alarming accuracy.

The organization tempers these controls of thought, feelings and actions by saying, "We'll pay you well, look after you when you are sick, provide for your old age, provide for your wife and children if you die, loan you money to buy a house, car, or whatever, move you from city to city, provide you with legal service, accounting service—on and on. The only demand is that you follow our line of thinking, feeling, and action. Give up your independence and we'll look after you. Give any indication of rebellion (independence) and your security will be removed."

The organization, like the mentally ill mother says, "As long as you do things my way, think as I tell you, and have appropriate feelings I'll love you. But if you fail to meet my demands you are totally rejected." Hinkle states, "When the individual is rejected by the group, inappropriate adaptive and defensive behavior and illness or death result."

The organization even goes so far as to encourage the male to live beyond his income by suggesting the neighbors, clubs, and way of life that are fitting to a "man of his position." It would be foolish to think that this is true only of the business or professional man. Even the lowly laborer is encouraged to join and over use the credit union. Certainly the laboring man, if such exists as a class today, mortgages his soul to have the material things which supposedly make life easier and indicate that he has status, i.e., power brakes, power steering, power windows, and automatic transmission—on a truck driver's private automobile. Of course, these "necessities for status" are available at a mere extra year's mortgage and should be ignored; but what does this organization-encouraged debt do to the male? It guarantees the organization a permanent employee! The male cannot quit even though his total being rebels against the controls on his thought, feeling, and action. He is a "company man" paid a salary not quite commensurate with his expenditures, and he likes "the good things in life." If he quits, he loses his accumulated retirement, his bonus, his incremented salary, his material possession, and starts again.

So modern man cannot quit—he must accept the dependency role and let his internalized psychic struggle for independence take its toll on the physical body.

Is it little wonder then that the male feels that he has "been there before?" The ring is closed and the male is trapped.

Now he begins his readaptation to the dependency role which he so recently left. But more conflict presents itself—he is no longer the child who has never known the delicious experience of freedom. True, he had not had time to understand freedom and its concomitant responsibilities, for he had decided that he should not assume the responsibilities of a free adulthood until he had a "secure" job. He got the job but by then it was too late. His was only a taste of freedom—for the most part the rebellious freedom of the adolescent which is seldom enjoyed as such because of its peer group dependence. Therefore before he could even think of functioning as a "mature" male he had to return to the dependency of the immature male.

And then what happens? The male is caught between his instinctive urges to be an autonomous agent and his instinctive need for security. The need for autonomy and creativity in the male, be it for a free and unfettered self or the begetting of children is a throbbing instinctive demand that refuses to go unnoticed.

Yet, just as deeply embedded in the brain is the need to be secure, and its impulses reverberate through the cerebral cortex like the roll of the tympani in Aaron Copeland's "Fanfare for the Common Man."

Man must create a self because it has been only through his creative efforts that man as a phylum has pulled himself to his present standards of social organization. Yet man must be secure, for old memories of the Cro-Magnon individual standing hungry and cold in the face of the advancing ice age are not extinct. Therefore, two of the most basic urges conflict; there appears to be no reconciliation. If modern man is to create a self that is free and independently responsible, he must forfeit the security offered by those organizations which can use only the conformingly dependent male. Every human being must have some direct instinctive gratification, but the ego or self is caught in trying to decide which shall be stifled—security or autonomy. We might wonder if death is the price which the male must pay when he tries to live with two equally demanding impulses, one of which must be denied gratification.

We know that conflict, internal or external, leads to tension; which, in turn, leads to anxiety which may manifest itself in any number of symptoms.

When man is in conflict his perception becomes distorted and Hinkle[28] found that high illness groups are those who perceive life as threatening, demanding and unsatisfactory.

According to Grinker,[29] in psychic conflict, if the ego functions of the cortex are not adequate to handle the anxiety present, the cortex or ego gives up allowing regressive, infantile modes of externalization of emotional expression for the sake of avoiding more prolonged or greater emotional feeling.

Dunbar[30] in discussing the problem says, "If the personality is unable to cope with the problem, if any marked degree of unpleasantness or conflict is involved, the whole process is likely to be excluded from consciousness and thus create a sort of short circuit into subcortical mechanisms."

Hinkle[31] states that persons with long histories of no effective adaptation and long standing anxiety exhibit severe thinking and adaptive difficulties.

We might wonder if the subcortical mechanisms result in the physiological reactions which lead to illness or disease formation, and eventual death. Grinker[32] reports, "Why certain individuals choose a specific physiological solution for their conflict is the unsolved field of the choice of neurosis," and Alexander assumes the answer probably lies in some unknown organic factors which in cooperation with psychic factors, lead to organ neurosis.

Meyer,[33] regarding the internalized conflict, says "The greatest difficulty in life, the greatest source of disharmony, apart from the influences of heredity, infectious disease, and poor feeding and poor chances for growth is the discrepancy between impulse, yearning, and ambition on the one hand and the actual opportunities and the actual efficiency of performance on the other." In discussing people in such a conflict he says, "Failing with what is frequently impossible and undesirable anyhow, these persons develop emotional attitudes and habit and tendencies to fumble or to brood or to puzzle or to be apprehensive until what students of the functional diseases of the heart call a 'break of compensation' occurs, a break of nature's system of maintaining the balance with a more or less sudden slump and implication of collateral functions."

So the organization has placed the male in a conflict situation; fear, the mother of anxiety, begins its fight to overwhelm him. As he has been placed in a loveless—non-expressive—dependency situation in his job, he hunts for some female, who in his memory is associated with his original dependency role, to meet the selfish love needs of this phase of his life.

The male is afraid—that he cannot be himself, that his security may be withdrawn and that he is unloved. The organization has forced his return to the passive dependent role of childhood. To whom can he turn? To whom does the frightened child turn? His mother! But the mother figure of yesteryear does not meet his needs for too frequently the memories of his struggle for independence from mother are coupled with fear, rather than love. If he returns to mother, she may deprive him of the "pseudo freedom" which he consciously believes he has acquired. So mother is usually discarded as the comforting protector against his fear. In desperation he turns to his wife and expects her to meet the selfish demands of his dependency with the same uncritical, forbearing love which he experienced with mother.

These demands confuse his wife for nothing in her training or experience had prepared her to assume a dependency nurturing role with her husband. The woman married expecting her husband to be mature to the point where he would assume complete responsibility for his feelings, thoughts, and actions. Yet she finds she is expected to meet her husband's infantile demands with the unselfish love of a mother. This is difficult for the young mother; she is just beginning to experience the meaning of selfless love with her own children. Then, too, her husband is not a child—he is a man and is supposed to act like one. Preferably, he should act in accordance with the memories of her beloved father. But her husband acts like a demanding child in his attempt to relieve the fear inculcated by his sensed loss of recognition, security and love which resulted from the conflict situation organization fostered through its return of the male to the dependency phase.

Much has been written lately which would lead us to believe that modern women have been plotting the downfall of the male for many years. One gets the picture of a woman whose household appliances have freed her of responsibilities and who has focused her unconsumed energy in scheming how she may take over the male role. It is now the vogue to debunk women as wives and mothers, and modern writers have done a magnificent job in portraying the female as a vixen whose sole purpose is to reduce the male to a dependent, sniveling child.

Yet is this what the female really wants? Few authors, who have assumed the role of critics, are women and no where could I find any research which would indicate that a systematic study of the female's attitude toward the male's role or her desire to emasculate him has been completed.

Could it be that the present attack on the female is merely another manifestation of the desire of the male to find a scapegoat. He knows that something is wrong but he cannot determine how he is responsible for his chronic feelings of inner conflict. The other group, be it the other race, nationality, religion, or the other sex, is always a convenient hate object. So the water becomes more muddy and perhaps the male will soon be able to convince himself that the female is to blame for all his problems. But will the projection of blame do anything about the increasing death rate of the male? I doubt it. Even if the woman assumed a completely subservient role man would still have to live with his inner conflict. The relegating of the female to a "second class" citizenry would not remove the shackles of dependency ties with the organization he has chosen as a mother surrogate, be it a corporation or a labor union. So modern man continues to focus his energy on the satisfaction of his survival needs, ignoring the equally demanding needs to be a recognized self. The male looks at himself and asks, "Who am I?" only to find that he must answer, "I am what I am told to be." He struggles to rationalize that he likes what he is, but his inner self will not accept this rationalization. It demands that he choose how he expresses himself in feeling, thought, and action. Overtly, man ignores his inner self but the demand to be free will not let him rest.

Conclusion

But what has this to do with the increasing incidence of the male death rate over the female death rate?

Evidence drawn from research shows that most of the disease entities resulting in males increasing demise have a recurring theme of conflicting psychic needs. Namely, a struggle between enforced dependence which satisfies the basic security needs and the coveted independence which allows for complete responsibility for the self.

Man, as a human organism, has a certain amount of energy which is available for the maintenance of the total organism in its life situation. As long as the organism is free from inner conflict, its energy is available for loving, learning and living. However, when the organism is attacked by bacteria, viruses, or psychic stress, energy must be diverted to resist the invader. And as long as the organism is under attack, the energy used in fighting off its enemy is unavailable for living, loving and learning.

Modern man is in constant psychic conflict and the energy which should be available for regular maintenance of the organism is expanded in repression of basic emotional needs. Resultantly he is drained. The physical organism cannot maintain its necessary homeostasis because of this energy loss, and it gives way to the ravages of illness and disease.

I believe that only when the male is able to reconcile his psychic conflicts by accepting the fact that no human being can ever be completely dependent or completely autonomous will he be able to rechannel his life energy into the preservation and enhancement of the total self. In our existing world, the male must realize that interdependence is the essential goal.

The acceptance of interdependence is basic in the female. She admits she needs her parents, husband, children, and herself. At times she assumes the dependent role and at other times the independent role but she is quick to say, "I need you," and she sees that she is needed. She accepts life as a mutual reciprocity in taking and giving. Her willingness to accept the dependent, independent, interdependent roles frees her from the conflict the male carries within himself. How different is the male. He growls, "I don't need anybody," and adds "at least, I wish I didn't. It's not manly to ever lean on anyone."

So the female accepts the reality of life; adapts to the role needed and lives. The male rejects the reality of life, constantly struggling to reconcile what he is with what he wants to be, and dies.

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From the Literature

WILSON T. SOWDER, M. D.

In the year 1122, a daughter, Eleanor, was born to a rich, but difficult and quarrelsome, nobleman of Southern France.[1] Upon the death of her father, she became the Duchess of Aquitaine, as well as the Countess of Poitou. Being even richer in land than her overlord, the King of France, she was betrothed to the King's son at the tender age of 15.

The King, known as Louis, the Fat, died before the bride of the young Prince could be brought back to Paris and when she did arrive, it was as the Queen.

The new King, known as Louis, the Pious, had been reared in a monastery and the influence of this early experience seemed to persist throughout his life. Eleanor bore him two children and went with him on a crusade to the Holy Land, but she apparently never loved him. She is quoted as saying at one time that "she thought she had married a King but found she had wed a Monk." The Pope was persuaded to dissolve the marriage on the basis of consanguinity, although their blood relationship was rather distant.

Within eight weeks, Eleanor, who was now 30 years of age, married 18 year old Henry, the Duke of Normandy, and he became Henry II, King of England, within two years. Among the many children she bore her young husband before they too became estranged were Richard, the Lion-Hearted, later King of England, and John, of Magna Carta fame, who upon his brother's death succeeded him as King. Eleanor, therefore, in addition to her numerous other connections with nobility, was the wife of the Kings of the two rival nations, France and England, and the mother of two Kings of England.

Rich and powerful in her own right, experienced in politics as well as in social affairs, Eleanor was well equipped to develop and try out some ideas of her own. Having matched wits, generally successfully, with Archbishop Thomas-a-Becket, the Pope, two husband Kings and two sons who became Kings, as well as many other persons of high rank, she had good reason to gain confidence from her own ability and to overcome any sense of inferiority that she may have had for herself, or for womankind in general. She also had unique opportunities to observe at close range that the superiority universally attributed to men in her time was not always deserved, even by the Kings and Noblemen whom she knew so well.

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[1] Kelly, Amy: Eleanor of Aquitaine and the Four Kings, Harvard Press, Vintage Books, New York, 1958.

Note: Reviewer's comments are shown in italics.

Eleanor proceeded to put her ideas into effect by characteristically feminine methods. She became a patroness of poets and troubadours and established formal "courts of love" in Poitiers in Southern France. There for a time she and her daughter, Marie (by King Louis VII), operated an informal academy for the training of young royalty and young nobility. There the concepts later to be known as chivalry and romance were nurtured and from there they were spread throughout the Western World. At the time, her ideas were somewhat subversive and antisocial. They were not even entirely in conformance with accepted moral precepts. But they did encourage the practice of gentleness, cleanliness, courtesy, proper manners and good dress. And the code of conduct developed there taught rather undisguisedly the superiority instead of the inferiority of women.

The guidelines of the Roman poet, Ovid, for the seduction of women by men were used, but Eleanor and Marie skillfully inverted these, and the order of the sexes, and thereby laid the groundwork for elevating the status of women through the new chivalric code of manners.

The group of minstrels gathered about Eleanor's court professed to derive authority for the practice of chivalry from the Court of King Arthur, and one of them, Chretien de Troyes, upon the urging of Marie, wrote Lancelot and began the Arthurian tales. The new ideas spread rapidly throughout Europe and the "doctrine of the inferiority of woman has never had the same standing since."

In this monograph we propose to challenge the parallel doctrine of the physical superiority of man. After carefully reviewing the literature and some speculation in theory, we hope the reader will question this doctrine with the same skill and cunning that Eleanor attacked the doctrine of the inferiority of women.

Historical Reviews of Morbidity and Mortality Statistics By Sex

The problem of sex differences in morbidity and mortality was reviewed rather comprehensively by Ciocco in 1940.[1] The lack of reliable data on the attack rate of illness is pointed out; however, on the basis of available data, he concluded that females had a higher sickness rate. On the other hand, males have a higher mortality throughout their entire life span including the fetal period, or at least the latter part of it. Differences are greatest in early infancy.

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[1] Ciocco, Antonio: Sex Differences in Morbidity and Mortality. Quart. Rev. Biol. 15(1):59-73 (Mar.) 1940; 15(2):192-210 (June) 1940.

The viewpoints of demographers and biologists as to the causes for the difference in mortality rates have ranged from social to "narrow constitutional." The author concluded that neither of the sexes demonstrates a superior vitality; "each possesses a greater liability to specific and separate fatal conditions." Important constitutional factors may be diversity in metabolism and the degree of masculinity.

As would be expected, females show a higher mortality rate from diseases associated with pregnancy and from those affecting primarily the endocrine system. On the other hand, males have higher death rates from diseases of the myocardial layer of the heart, the arteries, lungs, and the diseases in which the so-called chronic degenerative pathological processes predominate.

Ciocco quotes authorities whose research extends over a period of several hundred years to show that higher male mortality is a well-known phenomenon. He does not consider the problem as other than a static one—no changes or trends in the ratio of male to female mortality are pointed out.

Martin, whose report was published in 1951,[1] performed the monumental task of studying the mortality experience of males and females in England for a 100 year period in the years from 1841 to 1947 and found that the difference between the sexes progressively increased during this time, becoming particularly rapid in the latter half. The ratio at the beginning and at the end of the second half of the 100 years was four times the difference between the ratio at the beginning and end of the first 50 years. The trend was less marked in the very young and the very old age groups.

A satisfactory explanation for the phenomenon was not apparent. For some individual causes of death, the differences were ascribed to occupational hazards, social habits or physiological factors. Pneumoconiosis and other occupational diseases of the lungs and over-indulgence in alcohol caused higher male mortality; diseases of the thyroid and parathyroid higher female mortality.

A correlation was noted between the decline in infant mortality and an increase in the ratio of male to female death rates, suggesting that the mortality sex ratio is some function of the rate of the infant mortality. The ratio of male to female infant mortality by social classes supported this suggestion for it appeared to decline with the down trend in the socioeconomic scale of society, with the lowest infant mortalities having the highest mortality ratios by sex.

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[1] Martin, W. J. Comparison of Trends of Male and Female Mortality. J. Roy. Statis. Soc. Series A, Part III, 114-113-114, 287-306. 1951.

For ages 0-5, mortality rates were lower for males for the childhood infectious diseases—measles, scarlet fever, whooping cough and diphtheria. The male/female mortality ratio was 96 in 1901-1910 and 90 in 1940-1947. The decline in the death rates for the communicable diseases of childhood cannot therefore have contributed to the increase in male/female mortality since these were less fatal to male children.

Concerning accidents, Martin remarked, "Apparently boys did not have the care and attention that their sisters had, or they succumbed to injuries more easily, as shown by the much higher death rates for boys 1-5 for accidents and negligence." His opinion was that the greater desire for adventure could hardly be an explanation for the whole of the male excess.

For youngsters 10-14 in the period 1921-1925, tuberculosis caused 25 per cent of all deaths; the mortality ratio was 64. In the period 1941-1945, tuberculosis caused only 17 per cent of the deaths; the mortality ratio was 74. At ages 15-19, tuberculosis was the most important cause of death throughout the 100 years, causing one third to one half of the total deaths. In the first 50 years, the death rates for males were lower; however, in the next half century the situation was reversed and by the end of the period males had an excess mortality of 15 per cent.

For adults, it was found that the well-known upward gradient of mortality with social class had a varying slope for males and females. Changes in the relative importance of the various causes of death affected the mortality ratio during the 100 years. For example, at ages 5-9 in 1876-1880, infectious diseases caused one half the total deaths and one fourth in 1941-1945. The proportion due to violence increased from six per cent in the first period to 26 per cent in the latter four years.

Martin noted that the mortality sex differential varied by social classes and by occupations. The differential was particularly high in social class I with an appreciable portion due to coronary thrombosis. A discussant labeled this "the price of responsibility."

The reviewer and his associates at the Florida State Board of Health have been concerned with this problem for more than two decades. The following are brief summaries of reports we have published since 1952. Complete articles are reprinted in the appendix.

The progressively greater differences in mortality between the sexes since 1900, and the fact that the differences are apparent and definite in every age group are emphasized in the article published in 1952.[1] The lesser differential in mortality between the sexes in the Negro population also is noted. It is urged that the entire problem be investigated and that the medical profession give the same care and attention to the health problems of men as have been devoted to the care and treatment of women.

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[1] Sowder, W. T.: The Fragile Male, J. Fla. M.A. 38:553-554 (Feb.) 1952.

The age-adjusted death rates by race and sex for Florida and the United States for the period 1920-1950 are presented in another article.[1] We pointed out: (1) In 1920, the death rate among white males in Florida was 14 per cent higher than the rate for white females; (2) In 1930, the death rate among white males in Florida was 34 per cent higher than the rate for white females; (3) In 1940, the death rate among white males in Florida was 53 per cent higher than the rate for white females; (4) In 1950, the death rate among white males in Florida was 62 per cent higher than the rate for white females. Something other than a basic biological difference between the sexes was suggested to account for the more rapid decline in the death rates for women than for men. We expressed hope that the cause, or causes, would be found and that these would be at least partially preventable or correctable. Further study of the subject was urged.

In 1956, we again pointed out the much more rapid decline in mortality for females during the past few decades following a study of the mortality rates of the two sexes by the cohort or generation method.[2] Age alone was not the significant factor in the excess of male or female death rates; rather the point in time when the generations were born played the important role. At that time, there was comment upon the differences in culture and the cultural changes which had taken place affecting the various generations.

Male death rates declined only 50 per cent since 1900 as contrasted to 65 per cent for females.[3] As possible reasons for this decrease, Bond suggested that (1) women are less exposed to war, competition and occupational hazards; (2) they are more adaptable to stress; (3) they take better care of themselves when ill, and (4) they are more willing to seek medical attention. Further research on the problem presented an interesting and imperative challenge.

A number of other statisticians, actuarians, physicians and health officers either have written or commented upon this unique problem of sex differentials in mortality. A representative but not exhaustiv list of summaries culled from the literature are presented. These, plu

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[1] Sowder, W. T.: Why Is the Sex Difference in Mortality Increasing? Pub. Health Rep. 69:861-864 (Sept.) 1954.

[2] Sowder, W. T., and Bond, J. O.: Problems Associated with Increasing Ratio of Male Over Female Mortality. J. Am. Geriatrics Soc. 4:956-962 (Oct.) 1956.

[3] Bond, J. O.: Fragile Male. Geriatrics 12:489-493 (Aug.) 1957.

the bibliography following this session, should give the interested reader the necessary introduction to this vast literature

Probably very few actuarials or biostatisticians have observed the marked differences in recent mortality, when set forth for each sex.[1] These differentials have been increasing every decade for at least 30 years. The changes during the seven years from 1940 to 1947 were especially extensive. The peak at ages 15 and 20 occurred with the widespread use of the motor vehicle. The second, and less high peak, appeared at ages 50 to 60, when heart diseases had their toll or more accurately the cardiovascular-renal diseases. Ever since 1920 this peak has been increasing in size; it has moved from age 60 to 50.

During the past 45 years, the principal increases in the male/female ratio of death rates have been at ages five to 70, ranging from 30 per cent to 75 per cent and averaging 48 per cent at these ages. Thus, these ratios have increased at the very ages where death rates have declined. The females have benefited more than the males.

These figures have paralleled five events in particular: (1) a vast decline in deaths from tuberculosis and the infectious and parasitic diseases, (2) an increased urbanization of the people, (3) a continued decrease in the size of the family, (4) a marked increase in the use of machinery in commerce, industry and the home, and (5) freer dress and more athletic life of women. The decrease in the size of families has run parallel with the increase in urbanization. Tuberculosis, for example, has so often been related to childbirth. The substitution of mechanical devices for manual labor would be expected to decrease heart diseases; they have increased relatively due to the decline in many other causes of death. The transformation has probably been more complete in the home than in either office, factory, mine or transportation. The washing machine, vacuum cleaner, waxer, sewing machine and several other conveniences have replaced many fatiguing and often "back-breaking" jobs of a generation earlier. Perhaps women have adapted themselves better than men to the atomization, rationalization and artificialities of modern life. The disappearance of the whalebone corsets and the appearance of women in light athletics have no doubt had an influence favorable to the longevity of women.

When the effects of the changing age composition are removed, mortality trends become clearer.[2] The age-adjusted rates show three major trends, the first from 1900 to 1937. Starting about 1938, there was an acceleration in the down trend attributed to introduction of the sulfonamides and antibiotic therapy;

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[1] Bowerman, Walter G. Annuity Mortality. Transactions of the Society of Actuaries 2:2:76-102 (June) 1950.

[2] Moriyama, I. M.: Change in Mortality Trend in United States. Vital and Health Statistics, Series 3, No. 1, U. S. Public Health Service.

since 1954 there has been a leveling off. The prospects of a further decline are much more favorable for females than for males.

Certain important changes in the mortality pattern may be observed. Diabetes mortality is difficult to assess due to the major change in disease classification procedures in 1949. There appears to be an unusual change in the pattern, however, overlooking the large discontinuity in rates between 1948 and 1949. The trend for females has been generally downward. For those in the 45-54 year group, it appears to be leveling off. The death rate for males is increasing and in the nonwhite over 55 years of age, there is a definite increase. A clear upturn occurred for males in the period 1955-1960. In 1954, the rate for white males exceeded the rate for white females for the first time.

The chronic bronchopulmonary diseases are emerging as a serious problem. The death rates for diseases of the respiratory system, excluding influenza and pneumonia, are rising at an accelerated pace particularly among males in the older age groups.

The trend of mortality from the cardiovascular-renal diseases is downward for females and virtually flat for males. The trends for white females and males are clearly diverging but those for the nonwhite are more or less parallel.

For malignant neoplasms the death rate for white females is declining; the rate for white males is increasing relatively rapidly. Among the nonwhite the rate for females has changed little since 1950; the rate for males is increasing.

In human mortality, as in that for many other species, the death rate of males exceeds that of females at all ages of life, including the fetal period.[1] This differential is not explained away by the occupational hazards of males. Moreover, the more rapid reduction of female mortality than of male mortality from 1900-1902 to 1949-1951 has widened the differential. Male mortality is particularly high for the cardiovascular-renal diseases and tuberculosis at the middle and older ages and from peptic ulcer, accidents, suicide and homicide throughout life. Females have an excess mortality from diabetes mellitus at all ages and from cancer in early maturity and mid-life.

Studies of mortality according to marital status usually show that the married have lower death rates than the single throughout life, and that the widowed and divorced have the highest rates. The lower mortality of the married may be due to the selective process by which those in poor health remain

[1] Spiegelman, M. Factors in Human Mortality. Biology of Aging. Am. Inst. Biol. Sci. Symp. No. 6, 1960.

single. Furthermore, the married may receive better care to protect health and in case of illness. These are environmental advantages lost to the widowed and divorced.

Death rates for males are higher than for females at every age, and the superiority of the female is evidenced even before birth—her chances of being born dead are much smaller.[1] This mortality advantage is not uniform along the entire age span; it is greater at some ages. In infancy the rate for boys is nearly 30 per cent higher than that for girls. This may be taken as a rough estimate of the inherent handicap of the male. The disadvantage of the male increases and reaches a peak between the ages of 15 and 25 when young men are exposed to mortality risks over two and a half times higher than those for young women. The ratio of death rates reaches a low point at the late 30's, but even then men suffer a 60 per cent higher mortality than women. A second peak is reached in the late 50's where the death rate for men is nearly double that for women. After age 60 the ratio of the rates decreases, but the death rate for males remains higher than that for females until the very end of the life span.

No easy explanation for these differences is available. Among the causes of death, two account for a large part of the difference. The excess of the rates for males at the older ages is largely due to the cardiovascular diseases, while accidents account for much of the difference in adolescents and young adults. These causes, however, do not account for the entire difference. There is a considerable residue due to the combined effect of all other causes along the age scale, except in young adults.

This continued and increasingly greater advantage of the female is all the more remarkable in view of the diminishing differences between the sexes in many behavioral and cultural patterns as, for example, in gainful employment. If the stress of working accounts for the higher rate of males, it seems not to have the same effect on the females. Between 1940 and 1956 the percentage of women aged 14 and over who were in the labor force increased from 27.6 to 35.1. The similarities between the sexes have also been increasing in smoking, drinking and, of course, both sexes breathe the same air and in general eat the same food. It is thus evident that the interplay between the endogenous and exogenous sets of factors is indeed very complex.

Yerushalmy studied Jewish immigrants in Israel in order to test an hypothesis that health during the life of individuals is affected mainly by the environment up to age 15 years, and that improved conditions at later ages have little or no effect. This theory had been advanced 30 years previously by a group of English workers. He found that new immigrants suffered no

[1] Yerushalmy, Jacob: Factors in Human Longevity. Am. J. Pub. H. 53:148-162 (Feb.) 1963.

disadvantages as compared to old settlers in total mortality or in causes shown except for tuberculosis and the communicable diseases.

The comparison of the subsequent mortality of the immigrants from European countries and those from Asia and Africa is remarkable. In their countries of origin these two groups would, even under normal conditions, have exhibited widely differing patterns of mortality. It is, therefore, all the more surprising that even after their grossly different experiences immediately preceding their arrival in Israel, they reacted in a nearly uniform way to the common environment—a melting pot phenomenon as far as mortality from all causes is concerned. Total death rates were very close—those from Europe having somewhat lower rates in the younger ages and higher rates at older ages. There is a suggestion that women from Asia and Africa had lower rates from malignant neoplasms, and in the old ages somewhat lower rates from cardiovascular diseases.

Death rates specific for age, race and sex for the major cardiovascular-renal diseases as a group were examined in a study of trend of mortality from these causes in the United States from 1920 to 1947.[1] The outstanding finding was the increase in mortality among white males aged 35-64 years in contrast to the marked reductions in the same age groups among white females and, to a lesser extent, among nonwhite males and females. The death rate for white males in the working ages was not increasing for all other causes of death combined. The contrast between the trend for white males and females was most marked for diseases of the heart, slightly less so for chronic nephritis and inconsequential for intracranial lesions of vascular origin.

In this series of reports, of which this was the last, particular attention was called to several phenomena.

1. ". . . the increasing risk of death from the major cardiovascular-renal diseases among white males between the ages 35 and 64 years."
2. ". . . an upward trend in the death rate for these diseases among white males while the corresponding rates for white females are doing down . . ."
3. "In 1920, the difference between the two sexes was negligible while in 1947 the white male rate exceeded that for white females by 100 percent at 35-44 years of age, 120 percent at 45-54 years of age, and 97 percent at 55-64 years of age."
4. ". . . the marked excess in nonwhite mortality in (these) age group(s) . . . ."

[1] Moriyama, I. M., and Woolsey, T. D.: Statistical Studies of Heart Diseases. IX. Race and Sex Differences in the Trend of Mortality from the Major Cardiovascular-Renal Diseases. Pub. Health Rep. 66:355-368 (March 23) 1951.

5. " . . . . In the white population, the contrast between the sexes is very much greater for the circulatory and kidney diseases than it is for the other causes of death. . . . The death rate among white males in the working ages is not increasing for all other causes of death combined."

Among the objectives of this report were the presentation of statistics on age-sex-race-group death rates for specific cardiovascular-renal diseases and summaries of responses by consultants to the study.[1]

For nonwhites, the sex difference in cardiovascular-renal mortality was found to be relatively small as compared with the marked differential existing among the whites. Similar to the white population, the largest difference was in the death rates for arteriosclerotic heart disease; the sex ratio ranged from 1.2 to 1.8 as contrasted with 3.2 to 6.5 for the white.

In 1955, the largest contributor to the sex difference in cardiovascular-renal mortality was arteriosclerotic heart disease. The question was whether it was responsible for the divergence in male-female cardiovascular-renal mortality trends for adult white persons from 1920 to 1955.

Among middle aged white persons, it appeared most likely that the largest part of the divergence resulted from a sizable, real increment in the male death rates for arteriosclerotic heart disease, known to cause higher mortality among men. The emergence of this condition as an important problem, particularly in the susceptible sex, in combination with the downward trends for certain other diseases would amply account for the observed cardiovascular-renal mortality patterns in middle aged white persons from 1920 to 1955.

After reviewing these statistical studies, selected consultants were requested to provide answers to specific questions.

1. What medical, social or environmental changes have taken place in the past 25 years which, in your opinion, could account for an increase in cardiovascular-renal mortality among white males in the working ages at the same time that mortality from these causes among white females was declining?

2. What experiments, research or statistics can you suggest that you believe would throw further light upon this divergence in the male and female mortality?

The replies indicated wide areas of agreement irrespective of scientific background and discipline. It was recognized that purely endogenous, inherited factors almost certainly could not, of themselves, account for the observed trend; 27 years is far too

[1] Moriyama, I. M.; Woolsey, T. D., and Stamler, J.: Observations on Possible Factors Responsible for Sex and Race Trends in Cardiovascular-Renal Mortality in the United States. J. Chron. Dis. 7:401-412 (May) 1958.

short a time to bring about basic changes in inherent human biology. The increase in death rates among males for cardiovascular-renal diseases and the emergence of a sex differential could hardly be due simply and exclusively to an endogenous alteration developing in one generation, in coronary artery anatomy, in lipid metabolism, or in sex endocrinology. There might be long-standing, innate differences between the sexes along these lines; however, these could, in part, produce the relatively rapid emergence of gross sex differential only in interaction with relatively new exogenous, environmental factors.

Among these possible factors, considerable attention was given to diet. The differential may be due to a poorer tolerance in men than women for high-fat, high-calorie diets and obesity. Habits of overeating may be more common among men.

Socioeconomic developments were considered possibly significant. The effects of World War I and of the depression were noted. Attention also was called to increased use of tobacco and to greater exposure to noxious gases. These factors were deemed to be operative to a far greater degree in men than in women.

Regarding possible reasons for the decline in cardiovascular-renal mortality in white women from 1920 to 1947, the consultants suggested several factors. It was recognized that the sex differential in susceptibility to coronary disease might be related to endogenous gonadal function, estrogenic versus androgenic. As already indicated, these per se could not account for a trend developing in so short a time as 27 years.

The emergence in the early 1920's of the slim figure fashion was noted as an important influence which probably led to a considerable decline in obesity in white women. A marked difference was suggested in the developing dietetic habits of men and women. Moreover, with less childbearing and better medical care, there were fewer immediate risks in women with heart disease, as well as fewer long term cardiovascular-renal sequelae. The socioeconomic and medical developments probably contributed to lowering the incidence of cardiovascular-renal infections in women.

The higher over-all cardiovascular-renal death rates in nonwhites, and the failure of nonwhite women to exhibit the decline recorded for white women were attributed in part to poorer medical care in the South and Southwest.

Tuberculosis mortality is much higher among males than among females; the death rate for males (53.6) in 1939-1941 was 41 per cent higher than that for females (38.1).[1] This excess among males is higher than that for deaths from all causes; tuberculosis deaths formed 4.5 per cent of all deaths among males and 4.0 per cent among females.

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[1] Yerushalmy, J., Hilleboe, H. E., and Palmer, C. E.: Tuberculosis Mortality in the United States, 1939-41. Pub. Health Rep. 58(2): 1457-1482 (Oct.) 1943.

The decrease in tuberculosis mortality has been greater for females than for males. Between 1920 and 1940, there was a 66 per cent reduction for females but only a 54 per cent reduction for males. In 1920 the rate for males (116.6) was only six per cent higher than that for females (109.5). In 1941 the mortality for males (52.3) was 43 per cent higher than that for females (36.5). It is of interest that the acceleration in the rate of decrease in mortality of females as compared to that of males began in the late 1920's and continued through the decade of the 1930's. The rate of decrease for males has been rather uniform during the 20 year period, whereas, for females the rate of decrease paralleled that of males up to 1927 and from then on the reduction was at a much faster pace.

The larger decrease in the tuberculosis mortality rate among females as compared with males was present among whites (70 per cent as against 57 per cent) and among nonwhites (57 per cent as against 46 per cent).

Damon states that the outstanding feature of the differential sex distribution of disease generally is that women predominate in a greater variety of diseases and have a higher morbidity.[1] Men have a higher mortality at all ages and predominate in the leading causes of death. Of the ten leading causes, only hypertensive heart disease and diabetes mellitus show higher death rates among females than among males.

The explanation of many, if not most, sex differences in disease prevalence remains unknown. For example, rheumatoid spondylitis occurs in about the frequency of 19 men to one woman, although rheumatoid arthritis is twice or three times as common in women as in men. Similar discrepancies between the overall sex distribution of a disease and one of its variants occur in syphilis where the cardiovascular and neurological complications predominate among males out of all proportion to the sex ratio of syphilis generally.

In the entire gamut of thyroid disorders, benign and malignant, hyperfunction and hypofunction, women greatly predominate. Hypertrophic pyloric stenosis appears three or four times as often in male infants as in females and Legg-Perthes disease four to five times as often. But hereditary dislocation of the hip is over five times more common in females.

Donaldson and Kohl in an analysis of data which they collected over a ten year period, 1950-1960, on 2,641 twins among 238,172 deliveries could not confirm the previously "well accepted fact" that males have a higher fetal mortality rate.[2] They found

[1] Damon, A.: Some Host Factors in Disease, J. Nat. M.A. 54:424-431 (July) 1962.

[2] Donaldson, R. S., and Kohl, S.: Perinatal Mortality in Twins by Sex, Am. J. Pub. H. 55:1411-1418 (Sept.) 1965.

no association between sex and fetal deaths but they observed a higher neonatal death rate for the male (45 to 17). This very careful study casts great doubts upon previous statements about higher male fetal mortality.

Nature Versus Nurture

Speculation is attempting to guess whether biological or socio-cultural factors have played the predominant role in the changing sex mortality differentials.

A few authors have moved on from purely descriptive studies of the sex differentials in mortality and have attempted to describe causative factors or develop theories to explain the final statistics. In the following, we review the one major study which has ascribed the change to biological factors and several other studies which have strongly implicated socio-cultural phenomena. The unequal balance in review articles represents accurately the authors' bias in this argument. This will become apparent as these reviews are read.

Madigan has been the strongest proponent of the thesis that sex differences in mortality are due mainly to sex-related biological factors rather than socio cultural pressures and strains.[1] These play only a small and unimportant part, he concluded from the study of life records of 9,813 Brothers and 32,041 Sisters in Catholic religious orders for whom he believed socio-cultural factors were fairly well standardized. The period covered in the study, cooperatively designed with Vance,[2] was from 1900 to 1954 and the ages of the subjects began at 15 and 26.

He found that the Sisters had enjoyed a more favorable death rate except for the first two decades of the century. This favorable rate was particularly striking after age 45 and in the latter part of the period. Since social pressures and degenerative diseases would hardly cause such high death rates as plagued the Sisters aged 15-34 in the early part of the century, he concluded that some lethally infectious or contagious disease, such as tuberculosis, must have been involved. "The dangers of infection would be multiplied by the close life of the Sisters among themselves in the Convent."

He believed that the Brothers had fewer socio-cultural stresses than American men in general partly because they were free from the worries of husbands and fathers. In his opinion, the young Sisters had a more stressful life than their counterparts outside the convent. Under conditions of equal stress, he sug-

[1] Madigan, F. C.: Are Sex Mortality Differentials Biologically Caused? Milbank Mem. Fund Quart. 35(2):202-223 (Apr.) 1957.

[2] Vance, D. F. and Madigan, F. C. Differential Mortality and "Style of Life" of Men and Women a Research Design. Trends and Differentials in Mortality. Proc. 1955 Annual Conf., Milbank Mem. Fund, Pp. 150-163.

gested that women may be no more resistant to infectious and contagious diseases than men, but that in longevity the gains they have been making may be due to greater constitutional resistance to the degenerative diseases.

Madigan states that "there seems to be no question that the differentials between the sexes in prenatal and infant mortality are due to biological rather than to sociocultural factors." He adds that if the differentials in death rates between the sexes are sociocultural, then little can be done to improve man's lot, but if sex-linked biological factors are the cause, the prognosis is more hopeful.

This study, ingeniously designed and a valuable contribution to the literature, presents some conclusions which are not persuasive. For example, the incidence of tuberculosis and the death rates are known to have been much higher for young women than men in the early part of the century. Incipient tuberculosis probably was not detected by physical examination, particularly since chest x-rays were not routine. Madigan admits that the Brothers were more likely to smoke and drink occasionally. The Sisters were permitted only recently to smoke in some communities; however, the relationship between smoking and alcohol and death rates is not discussed. According to mortality figures, married persons live longer. This contradicts his claim regarding the favorable position of the Brothers due to freedom from the socio-cultural stresses of a husband and father.

Women having jobs outside the home, particularly those who are rearing families in addition, may not agree with his opinion that the young Sisters had a more stressful life. The opposite appears more logical in his statement regarding the inability to improve man's lot if differentials are due to socio-cultural factors rather than to sex-linked biological factors.

Enterline presents figures and a convincing argument which is contrary to that of Madigan.[1] His data lend "little support to a biological explanation for the increase in the sex mortality ratio." "While it seems reasonable to explain static sex differences in mortality from such degenerative diseases as malignant neoplasms, and cardiovascular diseases on biological grounds, it is difficult to explain trends in sex differences on this basis." He believes that environmental factors may be considerably more important than the biological.

Upon examination of the specific causes of death for the two sexes from 1920 to 1958, he found that there had been a decrease in rates for tuberculosis, diseases associated with childbearing, cancer of the uterus and high blood pressure,

[1] Enterline, P. E. Causes of Death Responsible for Recent Increases in Sex Mortality Differentials in the United States. Milbank Mem. Fund Quart. 39:312-328 (Apr.) 1961.

principally diseases of women. He attributed the reduction to social, medical and public health advances. At the same time there had been an increase in male death rates for motor vehicle accidents, lung cancer and coronary heart diseases. These were mathematically the principal contributors to change in ratio of male to female death rates.

Cowgill and Hutchinson's remarkably interesting observations on Indian families in the Peten Department of Guatemala support the thesis that differences in attitudes toward male and female children have an effect upon the moratlity ratio.[1] They studied "native Indian" families and compared them with "Ladino" families in the same area. The Indians maintained their native habits and culture, spoke a Mayan language at home and the women and children wore Indian clothing. The Ladinos were of mixed blood, spoke Spanish at home and their dress was European.

The startling finding was that by actual count among children below age 15 there were 178 males per 100 females in the Indian families, while in the Ladino families in the same region there were 86 males per 100 females. There was no difference in size of the family, food consumption, nor an unusual preponderance of male births.

The difference was established between birth and age five, and the investigators believed the phenomenon was due to cultural differences in the care of the children of the two sexes. For example, male infants were breast fed longer than the female. Instances were observed of male infants being breast fed after their younger sisters had been weaned.

The authors speculated that perhaps an unfavorable attitude toward female children contributed to the decline of the great populations in Classic Mayan times (300-900 A.D.)

In another paper, Cowgill and Hutchinson showed that somewhat similar mortality ratios, unfavorable to female children below age five, existed in a considerable number of countries "none of which however are among the most industrialized and medically advanced."[2] In countries with low infant and early childhood mortality rates, there was a definitely higher mortality among males in these age groups, but in countries with high (over five per cent) infant and early childhood mortality rates, the death rates for females was higher.

The authors cited Israel and Jordan which have populations presumably culturally distant but geographically contiguous.

[1] Cowgill, U. M., and Hutchinson, G. E.: Sex-Ratio in Childhood and the Depopulation of the Peten, Guatemala. Human Biol. 35:90-103 (Feb.) 1963.

[2] Cowgill, U. M., and Hutchinson, G. E.: Differential Mortality Among the Sexes in Childhood and Its Possible Significance in Human Evolution. Proc. Nat. Acad. Sci. U.S.A. 49:425-429 (Apr.) 1963.

Disproportionate emphasis is placed in each nation upon the survival of male children. In these countries, the "normalized" (corrected for greater number of male births) ratio of male to female mortality was 0.775 and 0.792 respectively as calculated from the 1959 Demographic Yearbook. This is in contrast to the mortality experience in the United States, typical of the Western industrialized nations, where the normalized sex mortality for this age period was 1.146.

A striking exception to the general rule was the South African "colored" population where mortality rates are high (18.85 per cent) for live births in the age group 0-4, yet the normalized mortality ratio was 1.034.

It could be the South African "colored" population shares with the Western industrialized nations a favorable attitude as to the value of female children.

Observations by Cook and Hanslip in the Near East, including Lebanon, Syria, Jordan, and also among the Arabs of Palestine support the figures given by Cowgill and Hutchinson.[1] Several nurses mentioned to these two British medical officers serving in that area how unusually common it was for the boy to be the survivor when twins of the opposite sex were born and one died. This observation apparently led to the more detailed study.

Cook and Hanslip found that "although more boys are born in Jordan, as elsewhere, yet the total deaths of females in the 0-1 and 1-4 year age groups exceed those of males in both Jordan and Israel (non-Jews) in every year for which figures are available." The degree of reversal of the sex ratio of mortality was unique to that region.

A large number of children attending United Nations sponsored clinics were weighed and it was found that weight and state of nourishment of the female infants, as compared to recognized standards for each sex, was consistently below that for males.

The investigators did not find any disease affecting females more than males, nor any case of female infanticide or deliberate neglect. They concluded that the phenomenon was due to deeply rooted social and cultural mores which involved a marked preference for male children, leading to unwitting but significantly uneven distribution of food resources. The preference for boys is strikingly manifested to foreigners by the hearty congratulations offered on the birth of a son, and the silence and scarcely concealed disappointment which greeted the birth of a girl.

[1] Cook, R., and Hanslip, A.: Nutrition and Mortality of Females Under 5 Years of Age Compared with Males in the "Greater Syria" Region. J. Trop. Pediat. 10:76-81 (Dec.) 1964.

Hammond in an analysis of fetal and infant mortality found that the sex ratio was higher among whites than nonwhites.[1] This was reversed during the second half of the infant's first year of life. The sex ratio among fetal deaths was considerably higher than the sex ratio among live infants.

Generally, sex differences and race differences moved in opposite directions—high infant mortality was accompanied by small sex differences and large race differences. As environment improved, sex differences increased while the differences in race diminished.

Salek Minc of Perth, Australia, has presented challenging ideas regarding the psychological factors in coronary heart disease, a leading cause of death in which the male to female ratio is extremely high.[2] According to his studies, heart disease patients had a greater measure of rational control than a comparison group; they were more inhibited, less emotional. Those he observed were "solid" citizens, pillars of society and, in general, possessed all the "desirable" qualities of the man of Western society. But, Minc believed, this may have caused the coronary heart disease.

Emotions are healthy and "action without emotion may burden the heart more than emotion without action." He found that when activity is rationally determined and not emotionally motivated, the heart "is not in it" and, therefore, works less economically. He states that "Ischemic heart disease comes as a punishment for living in the age of reason."

As a final feature of this review attention is directed to an article which presumably was not facetiously intended and which illustrates the serious social implications of this changing sex ratio in the population.

Polygyny after 60 could be a solution to a number of the social problems of the aged.[3] At one time, this modification of marriage was a socially acceptable way of life. Many aged persons are not able to adjust to the social changes which occur in their senescence. Unhappiness has been the result of their inability to establish a meaningful role for themselves in American society. They have become less aggressive and more passive while waiting for solutions to be affected for them; they appear contented in allowing the nation to grant them special privileges merely because they are elderly.

Polygyny could eliminate certain social problems, even though it would mean a total change in certain aspects of the

[1] Hammond, E. I.: Studies in Fetal and Infant Mortality, II. Differentials in Mortality by Sex and Race, Am. J. Pub. H. 55:1152-1163 (Aug.) 1965.

[2] Minc, Salek: Psychological Factors in Coronary Heart Disease, Geriatrics 20:747-755 (Sept.) 1965.

[3] Kassel, Victor: Polygyny After 60, Geriatrics 21:214-218 (Ppr.) 1966

structure of marriage. Its introduction would entail many complications but certain advantages for the aged would more than compensate for the trouble necessary to work through these difficulties. If the aged refuse to solve social problems for themselves, then rather than allow this group of persons to continue in their unhappy state, society must change. Therefore, the author recommends polygyny after age 60 because of the greater ratio of older women to older men. He states: "The need for polygyny is obvious; there just are not enough men."

The reviewer on the contrary thinks that this plan could not be put into effect because there are not enough women. According to reliable estimates,[*] *the ratio of women to men over 65 years of age will be 15 to 10 in 1985.*

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[*] Statistical Bulletin, Metropolitan Life Insurance Co., November, 1965.

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APPENDIX A

Reprint of Articles

The Fragile Male

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Physicians and laymen alike are familiar with the fact that the present life expectancy at birth for females is considerably greater than that for males, the latest figures being 64.7 years and 70.2 years respectively. Many of us have ascribed this to the fact that deaths more often affect males, as a result of military action, accidents and homicides, and have not realized that the matter goes much deeper. According to the National Office of Vital Statistics there has been a considerable difference in mortality between the sexes at least since 1900: and since World War I the differential in the death rate between males and females has become progressively greater. For example, in 1926 the age adjusted death rate for males was a little more than 14 per cent higher than that for females, whereas by 1948 the difference had increased to 41 per cent. The death rate for females in the United States decreased 13 per cent from 1940 to 1949 while the death rate for males decreased only 7 per cent. According to mortality figures for the United States for the year 1949, these sex differences in mortality are apparent and definite in every age group. For instance, in 1949 the death rate for infants under 1 year of age was 38.3 per 1,000 for males and 29.5 per 1,000 for females, the male death rate being 30 per cent higher than that for females. At the other end of the age scale, the death rate for males 75 years of age and over was 123.8 as compared to 104.2 for females. Also, it appears that the greater weakness of the male appears even before birth since in 1949 there were 10,353 deaths from congenital malformations amongst males as compared to 8,339 among females. In order to show the breadth of the problem the number of deaths by sex from several major disease conditions is given in table 1.

Similar figures are shown for Florida in 1949. Of 643 deaths occurring from tuberculosis, 424 occurred in males and 219 in females. Of 13 deaths occurring from poliomyelitis, 10 were in males. Of a total of 25,317 deaths occurring in 1949, 14,974, or about 60 per cent, occurred in males. One naturally wonders, if males die at a greater rate, why there is not a greater inequality in the sex distribution of the population. The fact that there is at present no great inequality in so far as the total population is concerned is shown by the fact that the population of the United States (United States Bureau of the Census esti-

State Health Officer.

Reprinted from
The Journal of the Florida Medical Association
38:553-554 (Feb.) 1952

mate) as of July 1, 1948 was 146,571,000 of whom 72,969,000 were male and 73,602,000 were female. One would expect that with such a differential in mortality there would be a vast difference in the number of female survivors in the older age groups. Of an estimated population of 446,000, 85 years of age and over in 1948, 191,000 were male and 255,000 were female. Nature in some subtle manner seems to arrange for a fairly equal distribution of the sexes by causing more male babies to be born.

In Florida for instance, in 1949 there were 106.2 male births per 100 female births. It is interesting also to note that there were 108.0 white male births per 100 white female births, as compared to 101.9 Negro male births per 100 Negro female births. Incidentally, the differential between male and female mortality in the Negro population in the United States is less pronounced than in the white population. Although males are born in greater numbers, their higher death rate brings the two sexes to about equal numbers at around age 20, and thereafter females are in the majority. Females have a substantially greater mortality rate from diabetes and about the same death rate from cancer. Deaths incident to childbirth have become almost negligible in the over-all picture in the United States and in Florida in recent years. In 1950 only 83 deaths from this cause occurred in Florida out of a total of 26,533 deaths. Since deaths incident to childbirth are becoming progressively more rare, and deaths

Table 1.—Deaths from Specified Causes in the United States, 1949

Cause of Death	Both Sexes	Male	Female
All causes	1,446,000	824,220	621,780
Tuberculosis (all forms)	39,032	25,483	13,549
Syphilis and its sequelae	8,236	6,179	2,057
Acute poliomyelitis	2,074	1,261	813
Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues	204,651	102,671	101,980
Diabetes mellitus	24,488	9,671	14,817
Major cardiovascular-renal diseases	746,854	420,544	326,310
Pneumonia and influenza	40,042	22,738	17,304
Ulcer of stomach and duodenum	8,020	6,540	1,480
Appendicitis	3,792	2,304	1,488
Hyperplasia of prostate	6,027	6,027	
Complications of pregnancy, childbirth and the puerperium	2,954		2,954
Congenital malformations	18,692	10,353	8,339
Birth injuries	12,320	7,164	5,156
Postnatal asphyxia and atelectasis	12,301	7,521	4,780
Immaturity	24,480	13,802	10,678
All accidents	88,681	61,820	26,861
Suicide	17,125	13,258	3,867
Homicide	8,812	6,686	2,126

Note: Deaths from specified causes do not equal deaths from all causes because of the omission of some categories from the table.

from diabetes are preventable in a large proportion of cases, and since the major types of cancer causing death among women are those of the breast and cervix which are more susceptible to treatment than other types of cancer, it appears that the outlook for further decreases in mortality is more favorable for the female than for the male.

Every practicing physician should give considerable thought to this problem. Much special effort in the past has been devoted to the care and treatment of women. The time has arrived for the medical profession to investigate the problem and determine whether or not more attention should not be paid to the health of the weaker of the sexes.

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Because the death rate for women is declining much faster than the rate for men, it is suggested that "something" other than a basic biological difference between the sexes accounts in part for the higher mortality among men. It is proposed that more attention be given to the study of male mortality.

Why Is The Sex Difference In Mortality Increasing

By WILSON T. SOWDER, M.D.,M.P.H.

In 1662 Captain John Graunt, citizen of London, in a publication entitled "Natural and Political Observations" reported that more men than women are born and that more men die before their time. He noted, however, that "physicians say that they have 2 women patients to 1 man." These observations were made by a layman nearly 300 years ago; yet, public health workers even now give these matters little attention.

Today in Florida and in the United States about 106 white boys are born for each 100 white girls. The death rates in each age group are considerably higher among males than among females, but various surveys in recent years have shown that women are ill more often. Among the nonwhite population, too, more boys than girls are born and the death rate for males is higher than the rate for females, although the differences are not nearly as great as among the white race.

The life expectancy of a white girl at birth in Florida is 73.9 years, but a white boy at birth may expect to live only 66.7 years, a difference of 7.2 years. That this difference in life expectancy exists is well-known to all public health workers, but few have given much thought to the reasons for it. Many of those who have, apparently have concluded that there are basic biological differences between the sexes which bring about a higher mortality among men. This view is supported to some extent by the fact that nature arranges for the birth of a greater number of boys than girls.

It is conceded that women may be biologically somewhat more resistant to disease and death than men. Evidence is available, however, which suggests that men are in some way, consciously or unconsciously, adding to their native handicap in the struggle for existence and that, therefore, something can and ought to be done to reduce mortality among men.

Dr. Sowder, a commissioned officer of the Public Health Service since 1934, is now on leave and has been serving as State health officer of Florida since 1945.

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Death Rates of the Sexes, 1920-50

In support of the premise that the higher mortality among men is due in part to something other than basic biological differences is the evidence provided by comparison of the male and female death rates over a long period of time. Death rates for both sexes, of course, have been declining for many years. Significant is the fact that the rate for females has declined much more rapidly than the rate for males (table 1).

The age-adjusted death rate in Florida for white males decreased from 13.8 per 1,000 population in 1920 to 9.1 in 1950, a decrease of 34 percent. The rate for white females in Florida declined from 12.1 per 1,000 population in 1920 to 5.6 in 1950, a decrease of 54 percent. The most startling facts, however, are these:

1. In 1920, the death rate among white males in Florida was 14 percent higher than the rate for white females.

2. In 1930, the death rate among white males in Florida was 34 percent higher than the rate for white females.

3. In 1940, the death rate among white males in Florida was 53 percent higher than the rate for white females.

4. In 1950, the death rate among white males in Florida was 62 percent higher than the rate for white females.

Table 1. Age-adjusted death rates, by race and sex for the United States and Florida, census years, 1920-50

Year	Age-adjusted death rates[1] per 1,000 population				Percentage excess of male rate over female rate	
	White males	White females	Non-white males	Non-white females	White	Non-white
United States						
1920	14.2	13.1	20.4	20.0	8	–3
1930	12.8	10.6	21.0	19.2	21	9
1940	11.6	8.8	17.5	14.9	32	17
1950	9.7	6.5	13.5	10.9	49	24
Florida						
1920	13.8	12.1	19.5	18.8	14	4
1930	13.1	9.8	23.3	19.5	34	19
1940	11.5	7.5	20.1	15.8	53	27
1950	9.1	5.6	14.7	11.0	62	34

[1] Total United States population of 1940 used as standard.

The same trend is found among the white population in the United States as a whole, although the differences between the male and female rates are less; and also among the non-white population in Florida and in the United States as a whole, although again the differences between the rates are less.

Unless one is prepared to contend that the human race has changed biologically during these 30 years, it must be agreed that something other than a basic biological difference between the sexes accounts for the more rapid decline in the death rates for women than in the rates for men. It is hoped that more interest will be shown in finding this "something" and that it will be, at least partially, preventable or correctable.

Comparisons by Age Group

As shown in table 2, the percentage difference between male and female rates increased in every age group during the period 1920 to 1950, although the extent of the increase has varied from group to group. It will be noted that the largest percentage difference in the sex death rates shifted from the group under 1 year of age in 1920 to the group 15-24 years of age in 1950. In 1920, the differences were relatively small for persons past their first birthday, the largest difference being 17 percent. However, in 1950, differences were as high as 114 percent, and for all ages from 15 to 74 years the rates were at least 50 percent higher for males than for females. A specific example of the change which has been taking place can be seen in the data for the 45-54 year age group: The rate for men was only 10 percent higher than the rate for women in 1920 and 78 percent higher in 1950.

Comparisons by Cause of Death

Although death rates for nearly every cause of death for both sexes have been declining steadily, there have been a few notable exceptions.

It is well known, of course, that deaths from lung cancer are on the increase, especially among men. In 1950, the death rates from respiratory cancer were 24.1 and 5.4 per 100,000 for white males and females, respectively, as compared to rates of 4.8 and 2.1 in 1930. Here again rates for males are higher than those for females, and the difference is apparently increasing. If excessive smoking has contributed to this increase, as has been alleged, it will be interesting to follow the future trend of this disease to learn whether the increase in smoking among women will decrease the difference in mortality.

Table 2. Sex differences in death rates for the white population in the United States, 1920 and 1950

Age group (years)	Death rates per 1,000 population				Percentage excess of male rate over female rate	
	1920		1950			
	Males	Females	Males	Females	1920	1950
Under 1	98.1	76.1	34.0	25.7	29	32
1-4	9.8	9.0	1.4	1.1	9	27
5-14	2.7	2.3	.7	.5	17	40
15-24	4.2	4.3	1.5	.7	−2	114
25-34	5.9	6.5	1.8	1.1	−9	64
35-44	7.7	7.3	3.8	2.4	5	58
45-54	12.0	10.9	9.8	5.5	10	78
55-64	24.2	21.7	23.0	12.9	12	78
65-74	54.2	49.9	48.6	32.4	9	50
75-84	122.5	116.4	105.3	84.8	5	24
85 and over	253.6	247.0	221.2	196.8	3	12

In considering sex differences in mortality, the trends in mortality from the cardiovascular-renal diseases and ulcer of the stomach or duodenum are particularly interesting. It is generally thought that emotional tension, overwork, and worry have something to do with the development of these diseases and with their management and cure. Added together, the many kinds of cardiovascular-renal disease cause more than half of all deaths in the United States today. Ulcer of the stomach or duodenum, although the cause of a much smaller percentage of deaths, is also a very common disease. As pointed out in a recent study by Kaufman and Woolsey (1), a similar disparity in trend between the sexes is found for these two causes of death.

In this study death rates of the two sexes were compared for the periods 1921-26 and 1942-47. Among women, the death rates for both causes of death declined remarkably, and the declines were greatest in the younger age groups. The cardiovascular-renal disease death rate for women aged 25-34 years in the period 1942-47 was only 54 percent (down 46 percent) of the rate in the period 1921-26, and the declines were substantial but less in the older age groups. The death rate among women for ulcer of the stomach or duodenum was only 30 per cent (down 70 percent) of its former rate in the age group 25-34 years, and again the declines were substantial but less in the older age groups.

Among men, however, the trend in mortality from these causes of death was radically different. Although the rates for cardiovascular-renal diseases declined slightly among men in the age groups 25-34 years and 75-84 years, mortality in all the intervening age groups increased. The greatest increase, 35 percent, was among men aged 45-54 years. Among women in the same age group, the death rate for the period 1942-47 had declined to 73 percent (down 27 percent) of its former rate. The male death rate for this age group for 1942-47 was twice the female rate. For ulcer of the stomach or duodenum, the trend among men was about the same, except that increased mortality began at age 45 years and persisted into all the older age groups. That the trend in mortality from this cause has not changed is demonstrated by the fact that in 1950 the death rate was four times as high as the rate for women for all age groups.

In 1950, the death rates in the United States for nearly all of the 64 major causes of death were substantially higher among men than among women (2). Female mortality was significantly higher for only 3 of the major causes: diabetes (62 percent higher among women), cancer of the breast, and cancer of the genital organs. It is not surprising, perhaps, that the death rates from suicide and homicide were about three times as great among men as among women, that accidental deaths were more than twice as frequent, or that the death rate from syphilis was twice as high. It may be surprising to many people, however, that the tuberculosis death rate was more than twice as high among men as among women and that men died 50 percent more often from poliomyelitis and 20 percent more often from pneumonia and influenza.

The cancer death rate was 5 percent higher for white males than for white females. Cancer of the buccal cavity and pharynx and of the respiratory system killed four times as many men as women.

It is interesting to note that the two types of cancer which cause more deaths among women than men, cancer of the breast and of the genital organs, are relatively more easy to detect and to cure than most other types of cancers. The only other major cause of death which seems to affect women more than men, diabetes, is also relatively easy to detect and manage, and, even if it cannot be cured, it need not cause early death.

Speculations and Suggestions

Additional figures could be cited, but it is believed that enough have been given to establish that the death rate for women is declining much faster than the rate for men. Figures have also been given to show that male mortality is higher for most of the major causes of death. It has been suggested that the native frailty and fragility of the male cannot be the sole cause for the higher mortality, and the hope that study and research will be made to find other causes has been expressed. At present, it is possible only to point out a few factors which may have some bearing on the problem.

The man of today certainly has some handicaps which cannot be easily cast aside. In general, he is still the main breadwinner of the family and, therefore, is inevitably exposed to the worries and pressures of modern life, as well as to its physical dangers, to a greater degree than women. However, it does seem peculiar that the trend in mortality favors women at a time when more and more women have become employed and in occupations once monopolized by men. It may be difficult to show, therefore, that occupations account, in any large measure, for the higher mortality among men, although an occupational relationship should be investigated. A study of the Registrar General of England and Wales (3) pointed out that the rise in the mortality of men in going down the socioeconomic scale is largely a product of environment, rather than of occupation. This conclusion was based on the finding that the mortality of the wives of men in the various socioeconomic classes showed the same rise in mortality in proceeding down the socioeconomic scale as did the mortality of the men.

It may well be that a difference in the reactions of men and women to modern life, including work, has more bearing than the work itself. Men are considered more dynamic than women, and nature may have intended that their energy should be dissipated largely by physical exercise. Today, physical exercise is not the necessary part of life it once was; moreover, it is assiduously avoided by some. It is possible that women escape the consequences of worry, frustration, disappointment, and tension to a greater degree than men by being more vocal about these conditions, through tears or occasionally hysterics. The reaction of men, on the other hand, may be in the form of coronary disease, hypertension, or ulcers.

Men are naturally more aggressive and venturesome than women. Their aggressiveness and lack of caution might explain their higher venereal disease rate, greater addiction to alcohol, and greater tendency to homicide and accidents. It is possible that males get around more and therefore suffer greater exposure to tuberculosis, poliomyelitis, pneumonia, and influenza. However, it is not established whether males contract infections and communicable diseases more frequently or whether they are simply less resistant to them and recover less often.

It may be that women are better and more frequent customers of modern medical science than are men. Sickness surveys have shown that women are ill more often than men (4). Women possibly have a greater tendency to stay away from work for mild illnesses than men, to go to bed sooner and stay longer, to go to their physician earlier and return more often, and to follow their physician's instructions more faithfully.

Certainly, there are many more specialists in diseases of women than in diseases of men. It is also true that Federal and State governments have had special health programs for women for over a quarter of a century, but they have had none aimed specifically at improving the health of men. The health programs for women, of course, have been aimed primarily at preventing illness and death incident to the complications of childbirth, and there has been a progressive decline in deaths from such complications.

The facts raise the suspicion that men are suffering from the very ancient delusion that they are the stronger and superior sex, when, as a matter of fact, we can only be sure that their skeletal muscles are stronger. In past ages a big biceps counted a great deal in the battle for survival, but it means little now. An inventory should be taken of the physical, mental, and emotional assets and liabilities of the male, and the knowledge used to halt the trend that has been shown.

It is not suggested that less attention be paid to the health of women, for much remains to be done for them. The time has come, however, to do more about the health of men, particularly middle-aged and older men. The male population should be aroused to take advantage of all that modern medical and public health sciences have to offer. The medical and public health professions should be made more alert to the greater hazards faced by men.

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Problems Associated With The Increasing Ratio Of Male Over Female Mortality

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For several years one of the authors has been calling attention, by articles and other means, to the striking increase in the difference between the mortality rates of males and females in recent decades. Some interest has been shown in the subject, although there have been other reactions which have ranged from indifference to levity and from skepticism to the amused toleration received by a person who is normal in all respects except one. Talks on the subject have been publicized as humorous and the facts presented have been discounted with the charitable attitude that exaggeration is permissible when the subject is not important, and serious acceptance not expected.

The author of these original papers (1, 2) has at times felt like a child who sees a bear, but whose parents tell him it couldn't possibly be a bear but must have been a dog. Parents can be very persuasive in such situations, but if the bear doesn't go away the child's opinion may eventually prevail. Since the first articles on this subject were written, it has become more and more evident that the gap between male and female mortality rates is steadily widening and the authors take courage from these facts to call attention to some of their implications.

MORTALITY DATA

Methods

Table 1 lists the basic data. It shows that, although the mortality for both sexes is declining, the mortality for females has declined much faster during the past three decades. Table 2 shows the percentile excess of white male over female death rates, by age groups, for each of the decennial years 1900 through 1950. These excessses have been steadily rising for each age group throughout this period, and the ratio of male over female death rates is highest at ages 15-24 and 45-64 years.

Another way of studying this problem is to examine the data by an approximation of the cohort or generation method. In this method each cohort is followed and the ratios of male to female death rates are recorded by age while that same group of people move through their life span. For example, the cohort born in 1865-74 can be followed from the year 1900, when they were 25 to 34 years of age, across the diagonal outlined in Table 2 until they were 75-84 years old in 1950. The percentile excess of male over female mortality as the successive generations went

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TABLE 1

Age-Adjusted Death Rates by Race and Sex for the United States and Florida—Selected Years

Year	Age-adjusted Death Rates per 1,000 Population				Percentile Excess of Male Rate over Female Rate	
	White males	White females	Non-white males	Non-white females	White	Non-white
United States						
1900	18.4	16.8	28.7	27.1	10	6
1910	16.7	14.4	24.8	23.2	16	7
1920	14.2	13.1	20.4	21.0	8	–3
1930	12.8	10.6	21.0	19.2	21	9
1940	11.6	8.8	17.6	15.0	32	17
1950	9.6	6.5	13.6	11.0	48	24
1953	9.5	6.1	13.2	10.2	56	29
Florida						
1920	13.8	12.1	19.5	18.8	14	4
1930	13.1	9.8	23.3	19.5	34	19
1940	11.5	7.5	20.1	15.8	53	27
1950	9.1	5.6	14.7	11.0	62	34

Total United States population of 1940 used as standard.

TABLE 2

Percentile Excess of Male Over Female (White) Death Rates, By Age Groups, by Decennial Years, United States, 1900-1950

All Ages	Year					
	1900	1910	1920	1930	1940	1950
Less than 1	23.6	24.1	29	27.7	30	32
1-4	8.0	9.2	9.0	14.5	16.7	27.0
5-14	0	7.1	17.0	28.6	37.0	40.0
15-24	3.5	14.5	–2	20.0	43.0	114
25-34	**0**	13.5	–9	13.9	27.0	**64**
35-44	10.4	**26**	5	26	38	**58**
45-54	10.7	27	**10**	34.8	52	**78**
55-64	11.7	21.4	12	**28**	50	**78**
65-74	10.7	12.2	9	19.8	**30**	50
75-84	7.8	8.3	5	11.8	15.7	**24**

through life is shown in Table 3 and Figure 1. This method assists in differentiating between the effects that age alone may produce in susceptibility or predisposition to a given phenomenon and the effects related to the time-periods in which the different generations lived (3).

Interpretation

Because of the short period of time these cohorts were followed, any conclusions drawn must be considered tentative. From our examination of the data, we note that the apparent selection of ages 15-24 and 45-64 for excess male over female mortality (Figure 2 and Table 2) disappears in the cohort graphs. Rather, there is a steady rise of M/F ratios as each generation goes through life. Moreover, as the generations occur later and later in time, this rise is progressively steeper, and the excess begins increasingly at younger ages.

TABLE 3

Percentile Excess of Male Over Female (White) Death Rates Per 1,000, By Cohorts, By Age

Cohort Birth Years	Age							
	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84
1815-24								7.8
1825-34							10.7	8.3
1835-44						11.7	12.2	5
1845-54					10.7	21.4	9	11.8
1855-64				10.4	27	12	19.8	15.7
1865-74			0	26	10	28	30	24
1875-84		3.5	13.5	5	34.8	50	50	
1885-94	0	14.5	–9	26	52	78		
1895-04	7.1	–2	13.9	38	78			
1905-14	17	20	27	58				
1915-24	28.6	43	64					
1925-34	37	114						
1935-44	40							

We interpret these observations as showing that age alone (e.g., ages 15-24 or 45-64) is not the significant factor in excess male over female death rates. Rather, the point in time when the generations were born plays the important role. The later in time they were born, during the past hundred years, the more selectively they were affected.

Since the older generations born before the period 1875-1900 showed no marked rise in excess male over female rates, as they passed through the period 1900-1950, it could be postulated they were born too soon to be influenced by the factors which have caused the striking increase in excesses since 1900. Similarly, the generations born after 1875 would seem to have been particularly affected, and obviously the influence was exerted during their younger years. So far as the authors know, no biologic changes have occured that would have selectively affected mortality by sex during this time. However, marked cultural changes have taken place during this period. The hypothesis that these have in some way influenced the mortality of the sexes differently is apparently supported by these observations that

PERCENTILE EXCESS OF MALE DEATH RATES OVER FEMALE, BY AGE AND BY COHORTS (UNITED STATES, WHITES)

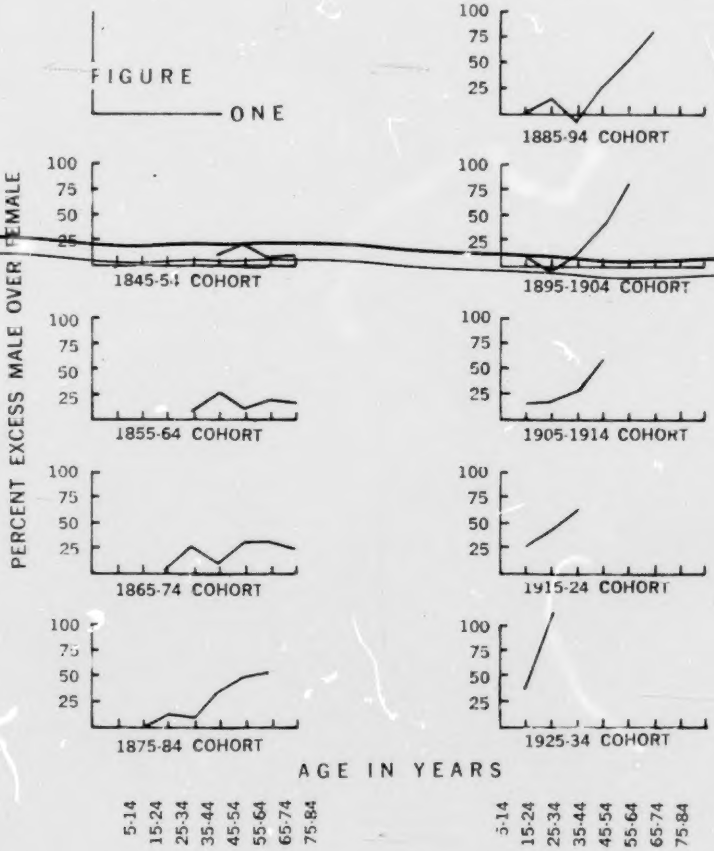

FIGURE 1

older people born and reared in a different cultural milieu, have remained relatively unaffected. Other explanations may be equally plausible, and it is the major purpose of this article not so much to prove a theory, as to stimulate further inquiries into the reasons behind this remarkable phenomenon.

PERCENTILE EXCESS OF MALE DEATH RATES OVER FEMALE, BY AGE (UNITED STATES, WHITES), FOR YEARS STATED

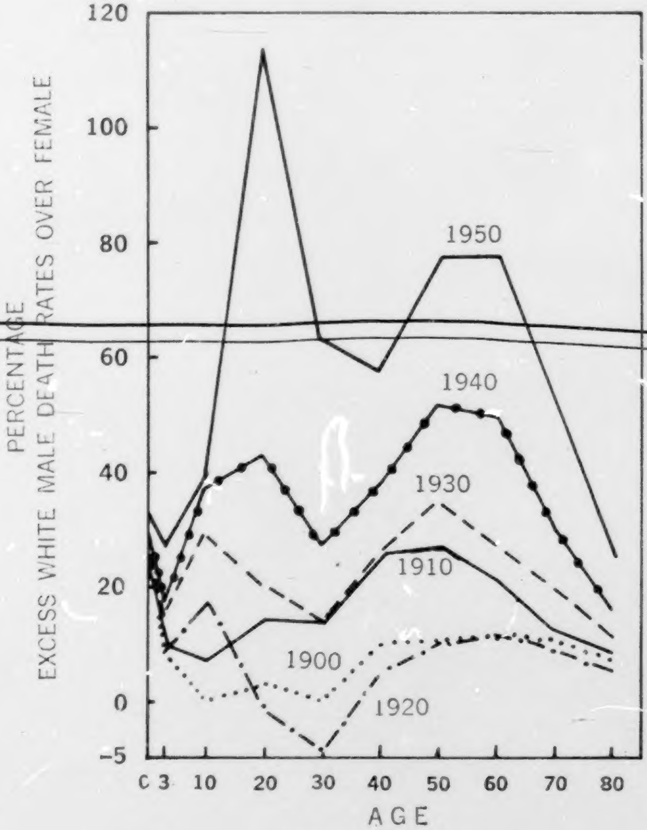

FIGURE 2

It has been previously pointed out that a higher male mortality occurs from almost every major cause of death which is not sex-specific, and furthermore that some of the major causes of death of females (such as diabetes, and cancer of the uterine cervix and breast) are particularly amenable to early treatment. This fact, when contrasted with the difficulties in the successful treatment of some of the diseases from which males more often die (such as cardiovascular-renal disorders, and cancer of the lungs, stomach and duodenum) portends an even greater difference between the mortality rates of the two sexes in the future.

Walter G. Bowerman of the New York Life Insurance Company has also called attention to the same phenomenon (4) and has presented some very interesting figures on the subject. Figure 2 shows clearly the tremendous relative change that has taken place in the relationship between male and female mortality rates since the beginning of the century. Bowerman is inclined, as are the writers, to ascribe the higher mortality of males in later childhood and early adult life to greater environmental hazards, and particularly to accidents. He suspects, as do the writers, that cultural changes have much to do with the higher mortality of males in later life and especially up to age 65. The writers strongly endorse his suspicion that "Women have perhaps adapted themselves better than have men to the atomization, nationalization, and artificialities of modern life." Bowerman also notes the lack of awareness of the problem. "Probably very few actuaries or biostatisticians have observed the marked differences in recent mortality rates, when set forth for each sex." He says that when he showed some of his figures to the head of the astronomy department of a great university he "reacted like the farmer who saw the giraffe for the first time, saying 'I just don't believe it.' " Bowerman shows why there can be a considerable difference between the mortality rates of the two sexes and yet the numbers of the sexes remain approximately the same for many years. As is well known, more males are born than females, or about 106 of the former to each 100 of the latter. Even though there are substantial differences in the mortality rates of the two sexes up to the middle life the actual mortality for both sexes is low.

The Statistical Bulletin of the Metropolitan Life Insurance Company has pointed out (5) that before 1930 more men than women migrated to the United States, and since that time there have been more women among our immigrants. Also, it was pointed out that more men than women emigrate from the United States. The widening difference in mortality rates between the sexes, and the foregoing facts with respect to migration plus war deaths, were bound eventually to bring about a preponderance of females in the population of the United States, in spite of the birth of 6 per cent more males. This has occurred and was shown for the first time in the Census of 1950, when females outnumbered males by 1 per cent. Although it has taken many decades for all these factors to produce a preponderance of women, and a national census to certify the fact, the time is drawing near when it will be evident to everyone. The Statistical Bulletin of the Metropolitan Life Insurance Company in an article (6) on future population trends predicts that by 1975 females will outnumber males by nearly 4 per cent in the entire population—in the 45-64 age group by 11 per cent, and in the 65-and-over age group by nearly 40 per cent (Table 4). Even in 1950 at ages 65 and over, females were in the majority by nearly 12 per cent. This change in the make-up of our population is having, and will have, greater repercussions in many aspects of our society. It means that a greater percentage of our older people will be women. It means more widows and longer periods of widowhood. Unless the practices and patterns of employment change, it means a greater proportion of our population will be unemployed and unemployable. Insurance companies may recognize this trend by charging men more and women less for life insurance, and by the reverse in case of annuities. If the struggle of making a living and providing for the welfare of a surviving widow has anything to do with the earlier death of men, the prospect is that he will have to struggle harder in order to provide for the lengthening life of womenfolk, and as a consequence will shorten still further his life span as compared to that of his mate. This may seem to be a gloomy outlook but at the present time it seems to be a reasonable prediction. It is a matter of opinion whether the outlook for men is brighter than that for women. Certainly widowhood, loneliness, and reduced financial circumstances are difficult for persons of either sex, and adjustments to such changes and situations are not made easier by age nor by the fact that they are commonplace.

TABLE 4

Population of the United States, 1950-1975.—Females Per 100 Males*

Year	Age					
	All ages	Under 5*	5-19*	20-44	45-64	65 and over
1950	101.0	96.2	97.2	103.1	99.8	111.6
1955	101.6	96.1	96.3	102.8	103.4	116.0
1960	102.2	96.0	96.0	102.1	106.5	121.8
1965	102.7	96.0	95.8	101.1	108.6	128.0
1970	102.9	95.9	95.7	99.8	110.1	133.4
1975	103.9	95.8	95.7	98.9	110.8	137.8

*Reproduced by permission of the Metropolitan Life Insurance Company.

There is an urgent need for a more general recognition of the fact that the higher mortality of men is steadily decreasing the proportion of men in the population; and that biologic, psychologic, social and economic problems are bound to follow.

SUMMARY

The growing importance of the relative excess male over female mortality in the United States has been presented. The effects of this difference will become increasingly apparent in the older age groups, in which the factors producing an excess of females in the population reach their final culmination.

The possible factors operating to produce this excess are discussed, but it is pointed out that they are not accurately identified. The need for further research to accomplish this identification is emphasized by the social, medical and emotional problems that the excess older female population will present, as well as the problem to the home and the nation of the premature loss of male lives.

Acknowledgments

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5. Statistical Bulletin, Metropolitan Life Insurance Company, Vol. 33, No. 8, August, 1952.
6. **Ibid.,** Vol. 36, No. 3, March, 1955.

Male death rates have declined only 50 per cent since 1900, in contrast to 65 per cent among females. As possible reasons for this discrepancy, it is suggested that (1) women are less exposed to war, competition, and occupational hazards; (2) they are more adaptable to stress; (3) they take better care of themselves when ill; and (4) they are more willing to seek medical attention. Further research on the problem presents an interesting and imperative challenge.

The Fragile Male

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Although some of us may still persist in referring to women as the weaker sex, it is apparent that, at the present rate, the weak shall inherit the earth. According to our present statistical trends, it is truly a case of "the fragile male."

Mortality Rates

While total death rates have been declining steadily and comfortably over the past half century, rates for women have dropped at a progressively faster rate than have those for men. This has been most marked in the white population where male death rates have declined 50 per cent since 1900, contrasted with a 65 per cent decrease for females, as shown in the accompanying figure. Thus, in the United States in 1955, although there were 1,382,000 more females in the population, there were actually 200,000 more male deaths.

This excess force of male mortality occurs in every age group, and has been steadily rising in each respective age group, although it is highest for the early and midadult ages of 15 through 24 and 45 through 64.[1] For all ages, the age-adjusted death rates in white males in 1953 were 56 per cent higher than those for females. This is to be contrasted with the year 1900 when they were only 10 per cent higher.

It was evident to actuarians of twenty years ago that this increasing difference in male and female mortality would eventually produce observable changes in the sex composition of the population. Today it is becoming increasingly evident to everyone. Beginning about 1945, women began to outnumber men in the total population for the first time in the nation's history. By 1950, the census year, this excess was accurately measured at 1

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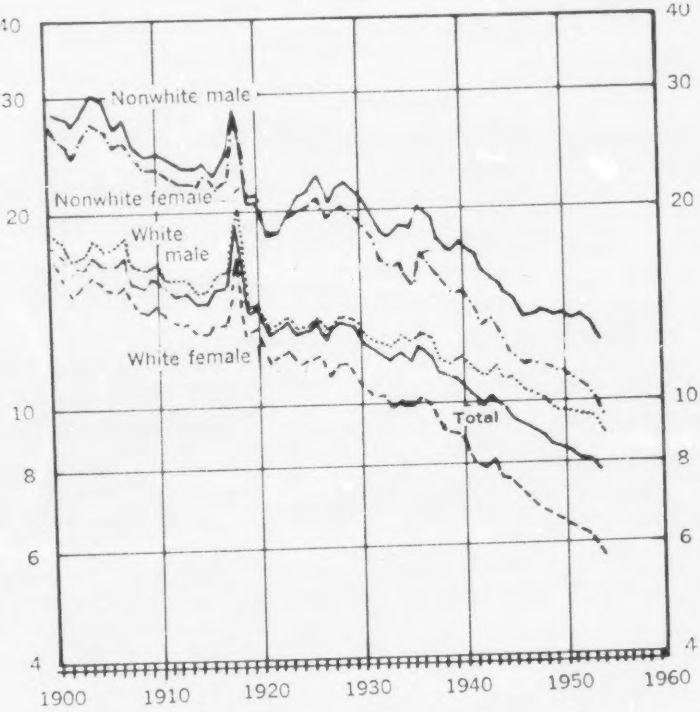
AGE-ADJUSTED DEATH RATES BY AGE AND SEX*
DEATH-REGISTRATION STATES, 1900-1955
(Rates per 1,000 population)



*From a chart of National Office of Vital Statistics, USPHS.

per cent. The statisticians of the Metropolitan Life Insurance Company predict that, if this trend continues, by 1975 there will be a 4 per cent excess of females in the total population. This excess will be even more noticeable in the older age groups where it is predicted that, by 1975, there will be 40 per cent more women than men.[2]

Life Expectancy

While these statistics may seem cold and impersonal, the effect of this phenomenon on the expectation of life should have warm personal interest for each of us. In 1900, a boy baby born in the United States could look forward on the average to 46.3 years of life. A girl born that year could expect to live an average of two more years, or a total of 48.3 years. By 1954, largely because of the elimination of the deaths from infectious diseases in infancy and childhood, males could expect to live 66.8 years.

CHANCES OF SURVIVING THROUGH A WORKING LIFETIME*
(United States, 1900-02, 1929-31, and 1949-51)

Age	White males			White females		
	1949-51	1929-31	1900-02	1949-51	1929-31	1900-02
	Chances per 1,000 of surviving from specified age to age 65					
20	668	596	514	796	665	555
30	680	618	551	803	688	593
40	697	650	604	816	718	645
50	742	713	685	847	770	718
	Chances per 1,000 of surviving from age 65 to age 75					
65	600	556	545	709	612	579
	Expectation of life in years					
20	49.5	46.0	42.2	54.6	48.5	43.8
40	31.2	29.2	27.7	35.6	31.5	29.2
65	12.8	11.8	11.5	15.0	12.8	12.2
75	7.8	7.0	6.8	8.9	7.6	7.3

*Reproduced from "Insuring the Older Ages," by Mortimer Spiegelman, Metropolitan Life Insurance Company.

However, a female child born in 1954 could expect to live 72.9 years, an expectancy of six more years than the male. The male in the United States is only now reaching the life expectancy that his fairer peer reached a decade earlier.

Dr. Spiegelman, a Metropolitan Life Insurance Company statistician, has shown that men around 50 years of age have a 74 per cent chance of attaining the age of 65. However, women of the same age have an 84 per cent chance of achieving this age. The pessimist will bemoan this favor the gods of chance have granted the ladies, but the optimist will look forward with pleasure to the prospects of relatively unlimited female companionship upon his retirement to Florida. At this point, I hope I have been reasonably successful in convincing you that the proper modern rendition of Shakespeare's oft quoted phrase should be "Frailty, thy name is man." And what makes our male so vulnerable?

The Reasons for the Discrepancy

It has been suggested that excessive male mortality is nothing new in nature, and may in fact be the rule rather than the exception. It has been observed to occur in many different species of animals, and it has been shown that, as far back as 1763, this observation was made in a human population. As further support for this argument, it is pointed out that nature provides for more male births. The ratio of male to female births in the United States is now approximately 106 to 100. However, there are also cogent arguments against this explanation. The primary one is based upon the fact that this ratio of male to female deaths has been steadily changing in the United States over the past fifty years. Unless one is prepared to advance the theory that the fundamental biology of the sexes has changed over this period, the hypothesis that this difference is due to biologic differences is rather tenuous.

It has been pointed out also that there are interstate, intercultural, and even international differences in these ratios of male to female deaths. Nineteen North American, European, and British Commonwealth nations were shown by Spiegelman to have ratios varying from 1.2 to 1.5. The United States has the highest ratio and the Scandinavian countries the lowest. The conclusion seems inescapable that someone, or something, has been 'tampering with the U.S. male,' and it is of course unlikely that fundamental biologic changes would be so selective.

Causes of Death

In a statistical search for clues, careful attention has been given to specific causes of death, as recorded in the routinely collected death-registration data. It has been found that, with only nine exceptions, all of the 64 major causes of death listed in the 1955 data for the United States showed higher male rates. Two of these nine exceptions were cancer of the breast and the genitalia, diseases which are largely peculiar to women. Heart disease alone accounted for over one-half of the 200,000 excess male deaths. The rate for deaths from heart disease in the male was some 1.5 times higher than the female rate. Of the specific heart diseases, coronary artery disease accounted for 93,000 of the 100,000 odd excess deaths in this category. Accidental deaths were the second major contributor and, in this group, the male rates were over twice as large as the female. Other specific causes, such as suicide and tuberculosis, have male rates three and four times as high as those for females.

The above comparisons were made from all age groups combined. For specific ages, accidents are the major cause of higher mortality from the age of 1 through midadult life. After age 45, heart disease assumes the major role, with assists from accidents, suicide, and tuberculosis. At the ages over 65, cancer appears in the list of diseases having higher male mortality rates.

Factors Related to Sex Differences

The most notable change in cases of death over the past fifty years has been the elimination of deaths from infectious diseases in infancy and childhood. The tentative conclusion from this would seem to be that males fare less well than females when subjected to the risks of dying from accidents or chronic and degenerative diseases. Several explanations have been offered for this. Perhaps the most attractive is that which suggests men have adapted themselves less well to the stresses and tensions of modern life in an industrial society.[3], [1] The marked increase in death rates among males for those diseases in which emotional stress is thought to play a causal role lends considerable strength to this theory. For men ages 45 to 54 it has been shown that the rates for cardiovascular-renal disease and ulcers have risen over 30 per cent in the past twenty years, while rates for females of the same ages for the same diseases have declined by about the same numerical percentage.[4]

It is postulated that perhaps women handle their emotional stresses with more social but less anatomic disturbances. For example, the wife may release her tensions through her tears, while her husband must act manly and choke his back into his coronary arteries. Virgil, the Latin poet, described women as "varium et mutabile," and it is possible that this characteristic of mutability is standing her in very good stead in our changing society.

It has also been observed that women take better care of themselves when ill, and are more willing to seek attention for their illnesses. Sickness surveys rather invariably show mirror images of the pattern of mortality statistics, with women having the higher rates of sickness reported. Once having sought medical attention, it is possible that women receive better care than men. There are specialists in female diseases, which do not have their counterpart for male diseases.[1] Many of the serious diseases of females, such as cancer of the breast, cervix, and uterus, and diabetes, are more easily detected and treated than typical male disorders, such as cancer of the stomach and intestines or cancer of the lung. It may even be ironic that the one cancer of males that has been most susceptible to treatment, cancer of the prostate, has been treated with female hormones.

Other explanations offered for the differences in the male and female death rates have been excessive cigarette smoking among men, the fumes and fury of mechanized travel, exposure to war and occupational hazards, and even the decreasing hazards of childbearing in women. Upon careful study, however, it is found that although these factors may account for same small segment of the problem, they do not begin to explain the total problem.

Further research presents an interesting and imperative challenge. Fundamental to this research, however, should be an awareness on the part of men that their heavier musculature, which is their biologic badge of masculinity, is probably no longer an advantage in the competition for survival in a western industrialized nation. Indeed, it may even be a liability due to the psychologic role it forces men to play in a society which no longer accommodates that role. Once properly oriented, perhaps men can address themselves to a leisurely search for the causes of their unfavorable mortality ratings.

What Can be Done?

It is not necessary to await the results of this research before taking some very practical steps. Accidental deaths of males at all ages can be prevented, but particularly should attention be given to the boys and young men. Then too, those of us who have so far escaped an accidental demise should begin to search for ways to avoid or relieve some of the relentless pressures that drive us up the ladder and into the grave. We should see to it that these pressures are not being built into our sons. We can all promote the very manly cult of routine physical checkups.

Having been practical, now to end on a philosophic note. It would be amiss if you were to assume that my major motivation in this paper has been to frighten the males into action to prevent their untimely demise. This would, I believe, accentuate rather than alleviate the problem. I would rather like to be remembered for having called to your attention a problem that is essentially man's doing, and should, therefore, be his for undoing. I should like to induce a little more humble, relaxed, and objective attitude of men toward themselves, for it is here perhaps more than anywhere else that the key to the solution of this problem is to be found.

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